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THE EFFICACY OF A COLLABORATIVE-INTERACTIVE TEACHER INSERVICE IN PROMOTING COMPUTER ADOPTION IN ELEMENTARY SCHOOLS

BY

RICHARD ALBERT ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of **MASTER OF EDUCATION.**

DEPARTMENT OF **ELEMENTARY EDUCATION**

Edmonton, Alberta
FALL 1994

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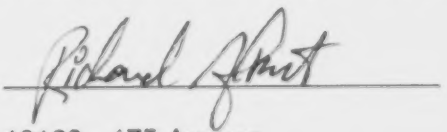

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled **THE EFFICACY OF A COLLABORATIVE-INTERACTIVE INSERVICE IN PROMOTING COMPUTER ADOPTION IN ELEMENTARY SCHOOLS** submitted by **RICHARD ALBERT** in partial fulfillment of the requirements for the degree of **MASTER OF EDUCATION**.

Dr. Roberta McKay

Dr. Bob Jackson

Dr. John Oster

SEPTEMBER 30, 1994

ABSTRACT

The efficacy of collaborative-interactive teacher inservice in promoting computer adoption in Elementary schools was investigated. Thirty-four teachers who attended a "Writing Process Using the Word Processor" Workshop sponsored by Alberta Education in 1988 and 1989 were included in the study. Questionnaires and selected interviews were used to assess teacher attitudinal changes and pedagogical response two to three years after attending the Workshop. Qualitative and quantitative data analysis revealed that while collaborative "hands on" activities support effective computer inservice, other elements make important contributions towards the success of a computer adoption effort. In order to promote computer use in Elementary schools, school administrators and teachers need to: 1. Refocus teacher computer inservice towards an ongoing process, 2. Employ effective inservice techniques, 3. Increase computer access time, 4. Stress integration by promoting a "tool" focus, 5. Establish electronic support networks for teachers, and 6. Promote teacher personal use of computers.

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Chapter I: The Research Problem

Introduction:

In this chapter, I will:

1. Provide an Introduction to the Area of Research
2. Outline the Purpose of the Study.
3. Highlight the Significance of the Study.
4. Review the Delimitations of the Study.
5. Examine the Limitations of the Study.
6. Offer a Definition of Terms.
7. Provide an Overview of the Organization of the Study.

Part 1: Establishing the Research Focus:

Personal computers exploded onto the educational scene in the early 1980's and their numbers quickly rose, along with the optimistic expectations made of them to revolutionize education. While statistics for Canadian schools are somewhat scarce, the American experience illustrates the proliferation of computers. By 1988, a U.S. Government Office of Technology Assessment survey "found that 95% of the nation's public schools had one or more computers and estimated there were at that time between 1.2 and 1.7 million computers in public schools alone." (Campoy, 1992). Another five years has elapsed since then, and while the number of computers in schools has continued to expand, it has become abundantly clear that the computer has not made a significant impact on the learning activities conducted in most elementary classrooms. Kinnaman (1990) cited a synthesis of research from nearly 1000 studies regarding the use of computer-related technologies for instruction by Williams and Brown (1989). "Williams and Brown conclude that while there is some evidence that well-designed computer assisted-instruction can be more effective than traditional instruction, the findings to date can be described only as moderately positive." This characterization has also been confirmed by many other researchers - most recently by Dunn and Ridgeway (1991), cited by Katz (1992) as concluding that "the computer has not as yet become the potent force in the educational system as was expected. (p. 39) This unfulfilled promise has generated a pessimistic attitude towards computers in the minds of some educators, and has prompted some educational observers to pronounce that "schools are unrevolutionizable" (Bosco, 1986, p. 112). In a commentary tinged with "black" humour:

> Jackson and Deal (1985) summed up their concern about the future for the use of computers [in schools] with a story about two imaginary computer companies trying to capture the school market. One of them manufactures

> real computers that work. The other produces less expensive devices with the external appearance of real computers which do not contain any working parts. They argue that the wise investor would do better to buy stock in the company manufacturing the phony machines, since schools respond to reform efforts through a display of symbols which provide a facade of change and advancement while the learning environment is unchanged. (cited in Bosco, 1986, p. 112).

While perhaps overly pessimistic, the aforementioned story characterizes a genuine educational concern - one that I have a personal interest in: Why haven't computers made a greater impact in the day-to-day conduct of elementary classrooms, and in particular, in Language Arts instruction? I specify Language Arts instruction, as nearly all microcomputers on the market offer word processing capabilities which offer the potential for enhancing reading and writing competencies. Through my own teaching experience however, I've noted that many teachers simply don't use computers in their classroom programs, or if they do, they restrict computer use to "skill and drill" activities or remedial work. I wondered whether this was a commonplace occurrence, and if it was, how teachers could be encouraged to adopt more and better uses of computers in their elementary Language Arts programs.

As I've considered the problem in recent years, I've come to the conclusion, as have many others, that the solution lies with the teachers themselves, and not with improved technology. "As Fullan (1982, p.107) points out, educational change depends on what teachers do and think - it is as simple and as complex as that." (cited in Corbett et al., 1987).

Some computer proponents have argued that to increase computer utilization in classrooms, one must convince or "convert" teachers through more inservice training sessions. Somewhat skeptically, I've wondered whether the solution is as straightforward as that. Will a dedicated training program incorporating co-operative learning strategies facilitate increased computer utilization by elementary classroom teachers in developing Language Arts competencies in their students? This question forms the basis for my study.

Part 2: Defining the Purpose Of The Study:

Teacher inservice is one method that has been traditionally used to facilitate the adoption of educational innovation by teachers. The introduction of the microcomputer into the schools has followed this pattern. Computers differ , however, from most educational innovations previously attempted, in that their integration into the school infrastructure demands simultaneous change - to both a deeper and broader extent - of : "a) new materials, b) changes in structure, c) new teaching approaches, and d) possible incorporation of new or

revised beliefs" (Fullan, 1983, p. 217). This situation raises doubts as to whether or not inservice techniques are an effective means to promote the incorporation of word processing in elementary classroom programs.

Using an investigative approach combining a questionnaire survey with follow-up personal interviews, this study attempts to characterize the subsequent pedagogical response of a selected group of elementary teachers who attended the "Writing Process using the Word Processor" Inservice sponsored by Alberta Education in March 1988 and March 1989, and to report on what the participants felt were the inhibitors and facilitators to them adopting word processing in their own classrooms.

Statement of the Problem:

Does exposure to word processing techniques through interactive and collaborative inservice promote teacher adoption of this computer application in their Language Arts programs?

Focussing Questions:

1. What word processing experience did the study subjects have prior to attending the Workshop?

2. What word processing expertise did the subjects gain from attending the Workshop?

3. How have the subjects applied their word processing expertise in their subsequent Language Arts teaching?

Part 3: The Significance of the Study:

To date, as Neilsen (1986, p. 728) commented, "the didactic model of teaching that has a stranglehold on inservice in North America minimizes the likelihood of educational change. The 'learning' remains superficial." He also asserted that "If the primary function of inservice education is to bring about change or, at the very least, to engender re-examination of beliefs and practices, then inservice programmes must involve participants in knowledge building." (p. 727)

The Writing Process Using the Word Processor Workshop sponsored by

Alberta Education seemed to reflect this concept of co-operative "knowledge building" in its design and execution. I was curious if any evidence could be found to show if this different approach to inservice would indeed be more effective than traditional inservice methods.

The 1986 official report of the Computers In Schools Strategic Planning Symposium stated: "It is our view that the teacher is the single most important factor in effective classroom instruction. Any consideration of the impact of computer technology on education that fails to acknowledge what teachers do in classrooms is likely to be ineffective." (p. 181)

It is my hope that my study might provide additional insight into how to further facilitate the contribution of the teacher component of the hardware - software - teacher triad in educational computing. As James Bosco (1986, p.127) notes: " . . . computers will have to be woven into the fabric of schooling. Without explicit attention to these issues, computers will continue to be in schools but they will too frequently be installed in a way which replicates the past flimsy use of technology in schools."

Part 4: Delimitations of the Study:

This study required the co-operation and support of the following agencies and individuals:

i. Alberta Education senior staffers
ii. School Superintendents and their staffs
iii. Teachers who attended the original Workshop.

It must be noted that:

1. Some Superintendents did not wish their teachers to participate in this study.

2. Some school jurisdictions had operational policies restricting access to teachers for educational research purposes.

3. Some teachers did not wish to respond to the study questionnaire. Also, some of those teachers who did participate in the study did not wish to engage in personal interviews regarding their questionnaire responses.

4. Some teachers who had participated in the Workshop had relocated to another province or had left teaching, obviating their inclusion in the study.

5. At the time the study data was being collected (Spring 1991), two, and in some cases, three years have elapsed since the subjects participated in the

original Workshop. This time-lag may have affected the accuracy of some specific recollections on the part of the subjects.

Part 5: Limitations of the Study:

1. As the Workshop participants were nominated from their respective school jurisdictions to attend the inservice, an unrepresentative number of the participants may have been enthusiastic supporters of computer integration prior to their attendance at the Workshop. Other teachers may have been directed to attend the inservice even if they themselves had no interest in computers in Language Arts. These two sub-groups of the study population may not be truly representative of the general teacher population.

2. The Workshop inservices were primarily oriented towards training teacher leaders in inservicing other teachers, not to develop specific word processing competencies in the participants themselves. This difference in emphasis may affect the generalizability of the results.

Part 6: Definition of Terms:

Word Processor - a hardware / software package that allows a computer to be utilized for creating, displaying, editing, storying and printing text.

The Writing Process - a writing methodology characterized by three recurring and interwoven stages: PreWriting, Writing, and Post Writing.

Part 7: Organization of the Study:

Design of the Study:

Although this study has elements of both quantitative (survey questionnaire) and qualitative (personal interview) research design, the overall design can be characterized as qualitative in nature. This approach has been chosen because:

1. The relative small size (34 respondents) of the target population sample may not fully support quantitative analysis.

2. Much of the data collected involves complex and elaborate personal

response, which may not be easily accommodated by quantitative analysis methods.

Ethical Considerations:

1. Throughout the study, the researcher made efforts to ensure that participation in the study itself was voluntary, with the subjects retaining the right to withdraw from the study at any time.

2. Prior to data collection, permission was solicited from Alberta Education, who was responsible for organizing the Workshop, and from respective school superintendents, to contact the teachers identified in the target population.

3. Throughout the study, participants were assured of confidentiality by the researcher. The identity of the study participants was known only to the researcher. Data elements which offered the potential of revealing participants' identities have been deleted from the database prior to analysis.

4. Analysis data was reviewed by the researcher and another graduate researcher, who acted as a second "reader" for validation purposes. On the rare occasions where differences in interpretation resulted, the contentious data were excluded from the study database.

Data Collection Methods:

After permission had been obtained from the jurisdictional parties involved (Alberta Education and respective School Superintendents), the study was conducted in two main stages.

Stage 1:

In Stage 1, a list of Workshop participants provided by Alberta Education was reviewed to select study candidates. A preliminary list of 106 candidates were selected from the general pool of Workshop participants. These initial study candidates were those individuals listed as elementary teachers, or those participants not specifically identified as administrators, junior / senior high school teachers, or central office personnel. Permission was sought from 76 respective School Superintendents to contact teachers identified on the preliminary list. Eight Superintendents did not respond to the request for research access, consequently eliminating eight teachers from the potential study population. In addition, of the Superintendents who did respond, some identified Workshop participants who could not be included in the study for various reasons. Twelve additional participants were thereby subsequently eliminated from the study population. Consequently, at the beginning of the

data collection stage, the potential study population had been reduced to 86 Workshop participants.

Letters of introduction and survey questionnaires were then mailed out to the 86 Workshop participants identified for possible inclusion in the study. They were asked to participate in a mail-back survey.

The mail-back survey itself had three main elements of focus:

1. Background Information About the Participants
2. Participant Perceptions Of the Effectiveness of the Learning Activities Conducted During the Workshop
3. Participant Application of Expertise Gained From the Workshop to Their Own Teaching

Along with the survey itself, Workshop attendees were asked if they would agree to a personal interview to allow for more elaborate response.

Fifty-four responses were received from the initial survey mail-out - a 63% return rate. Twenty of these responses were found to be inappropriate for inclusion in the study, however, as the survey questionnaire had not been completed. Among reasons given by the respondents for <u>not</u> completing the questionnaire were the following:

* 7 respondents identified themselves as Junior / Senior High school teachers who had not been listed as such in the Workshop Attendee List. They felt that their perceptions / experience would not be applicable to the elementary situation.

* 6 Surveys were returned - unopened, as the address of the participant had changed and Central Office personnel in each jurisdiction were unable to provide a forwarding address.

* 2 respondents indicated that they had not in fact attended the Workshop, although their names had been included in the Workshop Attendee List.

* 3 respondents identified themselves as Administrators and did not complete the questionnaire as they felt that they were outside the bounds of the target population for the study.

* 1 respondent was identified as a Central-Office person, having no direct student contact and therefore having no way to comment upon application of the skills they had gained in the Workshop.

* 1 response was received with the questionnaire incomplete. Some sections of

the survey had been completed while other sections were left blank. As the responses could not be properly contextualized, this survey was eliminated.

Taking into account the aforementioned survey questionnaires that had been eliminated, this left a population of 34 responses to base the actual study upon. Of these, 9 respondents indicated that they would agree to also participate in a telephone interview.

Stage 2:

Having established a study population, the survey data were then examined for recurring trends or themes. This information was elicited from the checklist responses and the more elaborate written responses from the completed questionnaires. This information formed the organizational framework for follow-up interviews with the 9 Workshop participants who had indicated a willingness to be involved in a personal interview. One interview of approximately 40 -60 minutes duration was held with each of the 9 respondents.

The questionnaire and interview data were then reviewed and results were tabulated for the following categories:

1. Age Grouping
2. Teaching Assignment At the Time of the Workshop
3. Years of Teaching Experience
4. Computer and / or Language Arts Teaching Experience
5. Prior Attitude Towards and Experience With Computers In a Classroom Program
6. Subjective Evaluation of the Utility of the Collaborative-Interactive Nature of the Workshop
7. Subjective Evaluation of the Utility of the Workshop Methodology In Promoting Word Processing Adoption By Teachers
8. Identification of Inhibitors or Facilitators Towards Personal Adoption of Word Processing Instructional Applications.

Conclusion:

In this chapter, I have introduced the area of research - teacher inservice, as a method for promoting the use of computers in schools. I have also outlined the investigative approach used, which combined a questionnaire survey with follow-up personal interviews, and have described the limitations and delimitations involved. The study itself attempts to characterize the subsequent long-term pedagogical response of a selected group of Alberta teachers who attended a computer inservice in 1988 or 1989, and to report on what the participants felt were the inhibitors and facilitators to them adopting word processing in their own classrooms.

Chapter II: Review of the Literature

Introduction:

In this chapter, I will examine the issue of computer utilization in the classroom. While this issue bounds on a multiplicity of areas, it can be most profitably examined from the following perspectives:

1. Statistical Data On Recent Computer Utilization Levels In Elementary Schools

2. The Computer As A Technological Innovation In Education

3. Resistance-To-Change Behaviour Manifested By Teachers

4. The Efficacy of Teacher Inservice As A Curriculum Innovation Facilitator

I will offer a brief overview of pertinent findings from each of the aforementioned perspectives.

Part 1: Statistical Data On Recent Computer Utilization Levels In Elementary Schools

Data on computer utilization levels in elementary schools is somewhat fragmented, often sketchy, and mostly derived from the American school experience. Even the information that is available is difficult to compare, as many agencies use different ways to quantify computer use in schools. The available data however does support the commonly held perception that teachers are not using computers in their classroom programs as much as was anticipated when computers first entered school systems. A 1985 survey of over 2,300 elementary and secondary schools in the United States conducted for the National Institute of Education and the national Center For Education Statistics indicated that only 6% of all English teachers used computers as a teaching tool. (Evans & Collis, 1987, p.387). In another American survey conducted in 1985, Beckert reported that ". . . a typical elementary school student who had access to computers at all used computers in school for about 35 minutes per week on average, but not necessarily every week. Many students never had access to computers at all." (cited in Carnoy, et al., 1986, p. 20)

A 1984 survey (Nelson & Waack) conducted in 108 Iowa schools reported more favourable computer utilization levels. The average utilization level for Gr. 1 - 6 was 75.7%. Of the respondents, 42.7% characterized their utilization as "Average To Frequent." It must be noted that the Nelson & Waack study did not

attempt to characterize what kind of computer activities the students were involved in, leaving the significance of the data open to question. For example, if the preponderance of utilization data was composed of low level "skill and drill" or remedial-type activities, the significance of the computer use would be downgraded. As was reported in the Becker study 1985, "the main use of computers in elementary schools (56%) has been for drill and practice." (cited by Bosco, 1986, p.114)

The British experience with computer utilization in elementary schools has been no less disappointing. As characterized by Heywood and Norman (1988, p.34) "Recent British research has shown primary teachers to be ignoring the computer altogether as a learning aid (Gardner, 1984), to be using it very little (Opacic & Roberts, 1985), or using programs representative of limited learning capacities (Bleach, 1986; Ewen & Roberts, 1985). Bleach reported "indifference" to be the prevailing attitude to the computer amongst teachers in her study."

And what of the Alberta experience? In a comprehensive Alberta Education sponsored study by Dr. M.W. Petruk of the University of Alberta (Alberta Education, 1986), it was found that "11.8% of the teacher population in the 580 elementary schools surveyed" were characterized as "extensive users" of computers in the classroom. (p.10) While the study did not specifically address the question of student utilization levels, it did report on student exposure to keyboarding instruction - a utilization subskill. "In 45.4% of the schools surveyed, less than one fifth of the students in the school have received instruction in keyboarding, while in only 8.4% of the schools surveyed, between one fifth and two fifths of the students received instruction in keyboarding." (p.188)

In a follow-up to the 1986 Petruk study, Alberta Education (1993) reported data for student access to computers under the category of "Integrated Computer Time Per Week." This data is summarized in Table 1.

Table 1: Computer Utilization Levels For Alberta Students (1993)

Utilization Level	% Of Responding Schools	% Of School Week
No time per week	3%	0%
Less Than 1 hour per week	43%	0.1 - 2.4%
From 1 - 2.5 hours per week	47%	2.5 - 6.25%
More than 2.5 hours per week	7%	6.3+%

This data would seem to confirm the view that "there is . . . a gap between the actual and potential use of computers in education." (Forman, 1983, cited in Evans & Collis, 1987, p. 387) A statement attributed to Bork in 1984 would appear to be mostly valid in the context of the present day situation in both American and Canadian schools "Despite the growing presence of computers in U.S. schools and colleges, computer-based learning remains a very small fraction of the total instructional system . . . " (Cited by Steier, 1985, p.22)

It would appear that how to improve computer utilization in elementary classrooms has been and remains a genuine concern for educators.

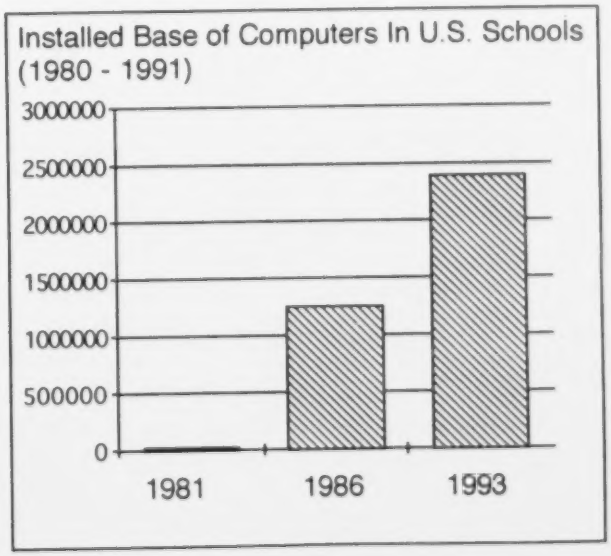
Part 2: The Computer As A Technological Innovation In Education

"In the 1980-81 school year, there were thirty-thousand computers in [American] schools, . . . at the beginning of the 1987-88 school year there were 1,253,486 computers in the [American] schools." (Bosco, 1986, p.113)

In the decade from 1980 to 1990 . . . "the number of microcomputers and computer terminals in U.S. schools increased by nearly 50-fold from fewer than 50,000 to roughly 2,400,000." (Becker, 1991, p. 385)

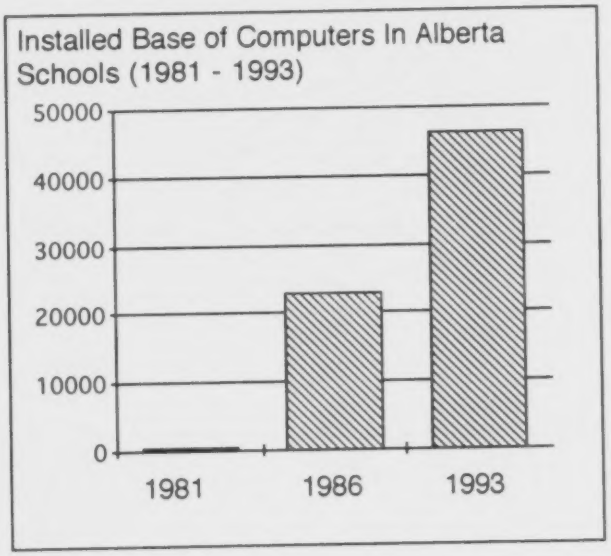
To gain a better sense of the magnitude of the increase in the number of computers in American schools, the data is represented in Figure 1.

Figure 1: Increase In the Number of Computers In American Schools



The Alberta growth experience for computers in the schools has been no less explosive. From an initial 256 computers reported in school use in 1981, computer use grew to 22,752 in 1986, (Alberta Education, 1986, p.22) , - an 88 fold expansion. From 1986 to 1993, a further 23,584 computers were added to the equipment base in Alberta schools. (Alberta Education, 1993, p.ii), an increase of 125% in seven years. This data is similarly displayed in Figure 2 to allow comparisons with the American experience.

Figure 2: Increase of Computers In Alberta Schools (1981-1993)



As can be seen by the two charts, the Alberta experience with computer proliferation in schools appears to match that of American schools. The numbers of computers in schools has been growing by leaps and bounds. However, while it appears that computers have had a definite impact on schools in terms of the numbers of machines placed, and their collective cost, the educational impact has been less dramatic.

Accordingly to Glenn and Carrier (1986, p.73), the educational impact of computers as an innovation "can be conceptualized into four broad categories:

(1) Effect on student outcomes
(2) Effective design strategies
(3) Implementation concerns including computer literacy, and
(4) Teacher training."

With regards to the effect on student learning outcomes, Glenn and Carrier (1986, p. 73) report that "The general conclusion from reviews of this research has been that [computer] technology instructs in some areas at least as well as

other methods and that students often prefer it . . . Despite these generally positive results, many individual students have reported little benefit to using computers for specific tasks within specific subject matters or for specific students."

This view has been supported by the work of more recent researchers. In a 1991 meta-analysis of 40 independent studies concerning the achievement effects of microcomputer applications in elementary schools, Ryan (1991, p. 177) concluded that "The underreporting of study and sample characteristics in primary research inhibits the development of new insights into relationships among variables and limits the potential of meta-analysis [concerning this topic]."

Cochran-Smith (1991, p. 107) confirms the need for more research. "What is most needed in this area are additional studies that consider the complexity of many elements and interplay of many relevant factors over time and within various learning contexts. We need to consider not only the outcomes of using word processing for writing with students at many levels but also the factors that affect these outcomes."

Kinnaman (1990, p. 32) addresses the research issue with the question "What's Wrong With the Research?" He cites researchers Brown and Williams. "They suggest that the lackluster results may be attributed to researchers' preoccupation with the 'comparative research' paradigm - the research model that pits CAI [Computer Aided Instruction] against traditional instruction. They fault the comparative research paradigm for its failure to distinguish between the media and the message. Under the comparative paradigm, researchers have a tendency to view technology as an experimental variable, independent of the instructional context in which it is employed. . ."

This perspective was also touched on by Krendl and Lieberman (1988, p. 370) in their earlier research where they commented that "Unfortunately, much of the research on computers and content learning has presented an 'either-or' scenario by comparing CAI with classroom instruction."

Other researchers have been more positive in their outlook concerning the potential benefits of using computers in classroom instruction. Bransford et. al. (1986, p.22) outline ". . . three general areas in which [computer] technology can facilitate learning: it can be used to help students develop fluency, to provide rich problem-solving contexts that invite thinking, and to enable students to create products that catch the attention of their teachers and peers. A fourth area in which [computer] technology can facilitate learning involves motivation."

These potential benefits to students, particularly with reference to Language

Arts instruction, are corroborated by Steier (1985), Miller (1986), Barker (1987), Evans & Collis (1987), Riel (1989), and Swich (1989).

Some researchers insist that more attention must be paid to the school organizational structure and the role of teachers if computer innovations are to become fully realized. Corbett et. al. (1987, p.39) comment that "Researchers have proposed many reasons for . . . [the] dismal portrayal of [past] innovative efforts: poor administrative planning and heavy logistical burden on teachers, insufficient time to learn new practices and inattention to latter stages of the change cycle, and the need for principals to be more dynamic leaders."

Brown (1980) argues that innovators must take into account the balance between the "rewards" offered to those [teachers] implementing innovations and the "costs" that are imposed. Brown (1980, p.36) adds that "one of the most crucial issues is to ascertain whether or not teachers have the skills necessary to implement the innovation." The central role of the classroom teacher as the initiator and facilitator of innovation is confirmed by Fullan (1982), Glenn & Carrier (1986),Constable (1986), Orstein & Hunkins (1986), David (1991), Kearsley & Lynch (1992), and Ringstaff & Dwyer (1992).

So what is preventing teachers from more fully adopting computer innovations in their classroom programs?

Part 3: Resistance-To-Change Behaviour Manifested By Teachers

Orstein & Hunkins (1988, p.232) observe that "Teachers frequently view change as just signalling more work - something else to add on to an already overloaded schedule for which little or no time is allotted . . . Often they view new curricular programs as requiring them to learn new teaching skills, develop new competencies in curriculum development and the management of learning resources, or acquire new skills in interpersonal relationships."

In the area of integrating computers into classroom programs, all of the aforementioned unfortunately apply. Heywood & Norman (1988, p.35) offer the concept of "spectres of resistance [that] are assembled both outside the school as well as within it to obstruct the change process." They focus on the "resisting individual" - the teacher, and explain that the resistance to change is quite understandable, given the consequences of adopting the innovation. "Work load increases and loss of confidence as the innovation de-skills the previously proficient teacher are valid and real problems: Genuine innovation begets incompetence." (p.35)

McAlpine (1987, p.259) noted that ". . . in many cases adults need to unlearn something before they can learn something new. Even when a change is

desired by an individual, extensive practice may be required to develop the new skill because old habits must first be extinguished."

Lest we judge teachers too harshly for not rushing to adopt computer innovation, Bosco (1986, p.117) cautions that: "Teachers are not people with philosophic predispositions which lead them to reject technology in their lives. They are not a "back to nature" group who eschew technology. They leave school each day and return to their homes with dishwashers, clothes dryers, televisions, VCRs and computers. In that environment they make amply use of technology."

Citing Williams & Williams, the authors of the 1984 book entitled Microcomputers In Elementary Education: Perspectives On Implementation, Glenn & Carrier (1986, p.77) provide the following set of teacher concerns and anxieties as reasons for the computer adoption "roadblock":

a) "fear of uncertainty about the technology"
b) "fear of change in the classroom environment"
c) "concern about the way technology may change the teacher / student relationships that exist in
the classroom" and . .
d) "concern about increased accountability brought about by technology."

Over and above these concerns, there is another phenomena manifesting itself with regards to computer use. It has been labelled by researchers as "computer anxiety" or "computerphobia." As defined by Leso & Peck (1992, p. 469), computer anxiety is "the fear or apprehension felt by individuals when they used computers or when they considered the possibility of computer utilization."

Levin & Gordon (1989, p. 69) report that computer anxiety "manifests itself in negative attitudes towards computers which can have a substantial effect on a person's ability to master skills associated with computers."

Citing a report by Cambre and Cook in 1984, Woodrow (1991) observed that "teachers often exhibit higher levels of anxiety regarding the use of computers than do their students." (p. 475)

Fortunately however, while it appears that computer anxiety on the part of some teachers is a deterrent to their using computers, the percentage of the total teaching population affected is small. In a recent review of the literature on teachers' attitudes towards computers, Dupagne & Krendl (1992, p. 424) concluded that "The literature reviewed . . . demonstrates that teachers' attitudes toward computers are generally positive. They view the medium as having great potential for classroom instruction. However, teachers share a

number of concerns about computers in the classroom. These apprehensions focus on hardware and software issues (including availability and quality), the necessary investments of the teacher's time to fully integrate computers into the curriculum, and the lack of adequate training programs to build teachers' confidence and abilities to use the technology to its fullest potential."

Some researchers have hypothesized that one way to reduce the impact of computer anxiety, and to increase confidence levels in adult learners in their ability to effectively use computers would be to provide them with more computer experience through short courses. Massoud (1991, p. 281) found that "Computer knowledge is . . . significantly related to all of the attitudes studied: anxiety, confidence, and liking."

Savenye, Davidson & Orr (1992, p. 32) cited "Studies such as those of Koohang (1987,1989) and Loyd and Gressard (cf. 1986) indicate that teachers' computer attitudes are related to their degree of experience with computers; hence the effects of an intervention, such as a computer training course, on attitudes are of interest to teacher educators. Maden and Sebastiani (1987), for example, found that a 15-hour computer course positively influenced the attitudes of inservice teachers. Berger and Carlson (1988) have reported similar results."

So is the provision of appropriate computer courses the most effective way to promote computer use by teachers?

Part 4: The Efficacy of Teacher Inservice As A Curriculum Innovation Facilitator

Carnoy et. al. (1986) list "teacher training" as one of the four important barriers to overcome if the full potential of computers is to be attained in education. One traditional method used to encourage teacher adoption of curriculum innovation, and to facilitate on-going teacher training, has been the inservice. In a 1988 survey of inservice practices in the United States and abroad, Blair reported that while 94% of American child school administrators: " . . . ranked inservice as important when compared to their educational activities in their districts" (p.50), " . . . 75% of the American teachers canvassed about their inservice experiences categorized these experiences as fair to bad. Among areas found lacking were: Little time allotment for observation, direct feedback, teacher involvement, release time, follow up activities, and fragmented nature of presentations." (p.52)

Neil (1985, p.53) offers ". . . five major reasons that inservice has not succeeded [in the past] are:

1. oversimplification of the inservice process
2. existing social ambiguities of the school milieu
3. galvanizing teachers' personal commitment can be difficult
4. the universities exert normative influences, and . . .
5. evaluation practices are usually weak or absent during inservice teacher education."

In a synthesis of research on inservice, Showers et. al. (1987) noted the following as critical factors for the eventual success of the implementation effort:

1. The importance of teacher attitudes towards the prospective innovation and the inservice itself.
2. The design of the inservice.
3. The post-inservice support provided for the innovation effort, and . . .
4. The basic level of skill or knowledge required for the teacher to "buy into" the innovation.

These factors have been essentially confirmed by Broyles & Tillman (1985), Glenn & Carrier (1986), Neilson (1986), Sparks (1986), Evertson (1987), Daresh (1987), Johnson (1987), and Ingvarson & Mackenzie (1988).

In spite of the generally poor track record of the teacher inservice in effecting genuine change in the classroom, as typified in the aforementioned studies, some researchers insist that there is no other credible alternative. Citing Lawton & Gerschner (1982), Gressard and Loyd (1985, p.203) suggest ". . . that the most effective way of alleviating 'computerphobia' and improving the computer attitudes of teachers in general may be the implementation of staff development [inservice] programs which provide opportunities for teachers to learn about and work with computers."

Madsen & Sebastiani (1987, p. 72) report that ". . . teachers who have participated in an inservice computer literacy course show significantly improved attitudes towards microcomputers" and also that they noted a ". . . significant improvement in teachers' knowledge about computers . . ."

Pepple (1986) concurs with this assessment, providing that teachers are involved with and participate in the development, field testing, and implementation of the innovation effort.

Carrier et. al. (1985, p. 18) state that "Currently there are at least two distinct groups of teachers who may wish to participate in inservice computer training. One group includes teachers who are motivated to learn about computers but who have little or no familiarity with them and perhaps a great deal of anxiety. A

second group consists of teachers who have worked with computers in their classrooms and on personal tasks. They are comfortable with the technology and wish to learn how to integrate the computer more systematically into their instruction in a variety of subject matter areas."

It is interesting to note that the teacher population sample accessed in this research study consisted of representatives from both of the teacher groups identified above.

Glenn & Carrier (1986, p. 77), citing Sparks (1983), summarized five components that characterize effective staff development approaches measured by changes in teacher behaviours:

"1. Diagnosing and prescribing - Begin with teacher's current level of expertise.
2. Giving information and demonstrating
   - Sensitive presenters.
   - Live models, videotapes, simulations.
3. Discussing application - Sharing ideas.
   - Teacher-to-teacher interactions.
4. Practicing and giving feedback - Microteaching.
   - Peer observation.
5. Coaching - Receiving feedback.
   - Non-threatening assistance."

Specifically addressing the field of computer inservice, Scrogan (1989, p. 81) identified eight keys for training success emerging from a U.S. Office of Technology Assessment report focussing on the integration of new technology in schools:

"1. Emphasize hands-on training.
2. Use credible instructors.
3. Build in close support.
4. Increase [teacher] access time.
5. Build a 'tool' focus - help teachers view and use the computer first as a productivity tool.
6. Integrate technology.
7. Go online - use electronic networks to enhance teacher support and education.
8. Don't leave home without one - provide teachers with computers for their own personal use."

A number of more recent researchers have confirmed the importance of these elements to inservice success - Jones & Lowe (1990), Benjamin et. al. (1990), Tulder & Veenman (1991), and Dusen & Worthen (1992), .

Some researchers have begun to explore in greater depth the possible advantages offered by inservices featuring a collaborative approach. This investigative thrust grew from the conceptual development of the writing process, and the realization that "word processing is a natural partner for writing process instruction." (Montague, 1990). Persky (1990, p. 37) concluded that:

> "When teachers engage with others in ongoing reflection about their instruction use of technology, they are more likely to critically evaluate their practice and redesign instruction to better meet student needs and curriculum goals.
>
> . . . and . . .
>
> In order to support teacher development, administrators must put structures in place so teachers can communicate and collaborate on a regular basis."

In reporting on the results of a massive collaborative inservice education effort in New York State spanning the the 1980's, Conway & Stevens (1991) concluded that "Changing . . . education statewide was a massive undertaking and a difficult process. However, the collaborative model produced the desired changes . . . Students benefited . . . and [the course] renewed the vigor of the teachers." (p. 194)

Repman (1993), in a study concerning collaborative computer-based learning, reported that "A growing body of research indicates that the effectiveness of collaborative, computer-based learning groups is related to the kinds of elaborated verbal interactions that take place during group processing. . . Training led to increased rates of giving explanations and higher self-esteem, while structure (with and without training) resulted in improved content area achievement." (p. 149)

Similar benefits of collaborative learning involving computers have been reported by Johnson & Johnson (1985), Johnson et. al. (1986), Cosen (1989), Reilly (1990), Schechter (1990), Mevarech, et. al. (1991), Anderson, et. al. (1991), Whyte et. al. (1991), Makuch et. al. (1992), and Nastasi & Clements (1993).

Conclusion:

The literature appears to offer the following conclusions about the issue of improving computer utilization in elementary schools:

1. Most classroom teachers do not make extensive use of computers.

2. When compared to other educational innovations, computer integration into the classroom program suffers from more than the usual problems involved with curriculum change.

3. Many teachers have not adopted computers in their classroom programs due to doubts about the utility of computers, lack of training, and concerns about the educational role of computers.

4. Inservice offers one method of improving teachers attitudes towards computers and their knowledge of how to effectively employ computers in their classroom programs.

Chapter III: Research Design and Methodology

Introduction:

In this chapter, I will:

1. Outline the research focus.
2. Identify the criteria used in establishing a research study population.
3. Describe the research population surveyed in this investigation.
4. Describe the research study time frame.
5. Describe the survey instrument used.
6. Elaborate on data collection procedures.
7. Outline how the data was analyzed.

Part 1: The Research Focus:

The design and methodology of this study was primarily driven by the fundamental research question: Does exposure to word-processing techniques through interactive and collaborative inservice promote teachers' adoption of these applications?

Inservice was chosen by this researcher as a research focus, as this is the most common method employed by educational administrators for initiating and facilitating curricular innovation or change.

The Criteria Used In Establishing A Research Study Population:

Having chosen inservice, the field of potential research study candidates was further restricted to satisfy the following criteria:

1. That the study focus on one specific inservice instead of surveying a number of similar but different inservice efforts. This design decision was an effort to enhance comparability of data elements.

2. That the chosen inservice involve elementary teachers, as changes effected at lower grade levels have a better chance of influencing student learning over a longer period of time.

3. That the inservice focus on computer techniques or applications, as computer use by teachers is primarily driven by satisfying instructional needs, rather than reflecting any specific philosophic orientation.

4. That the inservice was Alberta based, to facilitate access by this researcher, and to make the results perhaps more generalizable to the Alberta educational setting.

5. That the inservice design feature active collaboration and interaction on the part of the teacher participants. This design element has been promoted by Pepple (1986) as a way of enhancing the effectiveness of inservice.

Part 2: Description Of The Workshop:

With the previously mentioned criteria in mind, various study candidates were examined. The inservice program chosen as the focus of this particular research study was the Alberta Education sponsored "The Writing Process Using the Word Processor" series of Workshops. These Workshops were held in four widely geographically separated regions of the province of Alberta: Calgary - March 1988, and Edmonton, Grande Prairie, and Lethbridge, in March 1989. The dispersion of the Workshops ensured that a broad diversity of teachers could be studied, once again enhancing the generalizability of the study results to the general teacher population.

The original purpose of holding the Workshop, and the procedures followed, were concisely outlined in the Forward to the Alberta Education supplied Inservice Leaders' Reference Manual (1988, p.iii): "School jurisdictions selected teacher leaders who attended a provincial information session and were provided a set of inservice materials. These 'leaders' were then to help others in their school jurisdictions who wanted to start using the new approach [to integrate computer use with Language Arts instruction]."

Each Workshop session was conducted over a period of 2.5 to 3 days. The Workshop was structured to provide training in the areas of:

1. The Writing Process Using Computers
2. Instructional Strategies
3. Strategies For Evaluating Writing
4. Inservicing Procedures

Various instructional formats were employed in the Workshop sessions, including:

1. Traditional lecture format.
2. Small and large group discussion.
3. Partnership learning activities (pairs or trios, depending on the number of Workshop participants.)
4. Learning activities requiring Individual response or personal reflection.

It should be noted however that greater emphasis was placed on partnership learning activities, requiring collaboration on the part of the participants, and interaction with computers. The organization of the individual partnerhsip learning groups was also changed at various times during each Workshop session. Participant grouping assignments were repeatedly changed, usually prior to the start of a new learning activity. In this manner, Workshop participants had an opportunity to collaborate with a variety of learning partners - mimicking the organizational changes that might occur in the day-to-day running of a classroom program.

Part 3: Description Of The Study Population:

The participants of each regional Workshop included teachers, school principals and senior administrators from elementary, Junior High and Senior High School levels. For the purposes of this study however, the research focus would primarily be on the pool of elementary teachers.

Using the Workshop as a research base provided the following benefits in addition to meeting the previously stated criteria:

1. Wide Dispersion of Workshop Attendees:
The four Workshop sessions were held in widely separated geographic locations in the province. Additionally, due to scheduling and travel considerations, participants from all over the province attended each session. Participation was not restricted to attendees from just the local area surrounding the Workshop site.

2. The Same Format Was Maintained For All Workshop Sessions
Although the Workshop was held in four different geographic locations, and at different times - the same inservice format was essentially utilized for all Workshop sessions.

3. Wide Diversity of Attendee Experience Levels:
The Workshop attracted participants with widely differing experience levels in both Language Arts and computers. Some participants had extensive computer expertise, but had little or no experience in Language Arts instruction. This contrasted with other participants, who were primarily Language Arts teachers who had had little if any computer experience prior to attending the Workshop. This wide diversity of experience levels made the study population more representative of the general teacher population, once again enhancing the generalizability of the study results.

4. The Workshop Was Focussed On Integrating Computers With Language Arts:
This element pertained directly to the primary research question, as it

involved a computer / Language Arts interaction.

5. Extended Time Interval Between the Workshop and the Research Sampling:
At the time the data collection component of the study was conducted, two years, and in some cases, three years, had elapsed since the participants had attended the Workshop. As the study was intended to examine the long-term effects of inservice exposure, the extended time-lag between Workshop attendance and data sampling promoted more generalized and reflective responses from the participants. This related directly towards the overall objective of the research study: Was the Workshop effective in the long term?

6. Personal Experience With the Workshop By The Researcher:
As I had also had an opportunity to participate in the Workshop, I felt that this would allow me to better contextualize survey responses and participant interviews.

7. Contextualization Aids:
A substantial effort was made by the researcher to gather information about the character of the study population (ie. teaching experience, computer experience, etc.) to aid in the contextualization of the data collected, and to help in comparing the study population to the general teaching population. This information was collected as part of the survey instrument. As was discussed in Chapter II, 34 subjects were ultimately included in this study. The gender and occupational position characterization of the study population is shown in Table 2.

Table 2: Study Population Gender And Occupational Position Distribution

CATEGORY	**MALE**	**FEMALE**	**TOTAL**	**PERCENT**
Teaching	21	8	29	85%
Administration	2	0	2	6%
Other (Consultants, etc.)	1	2	3	9%
Total	**24**	**10**	**34**	**100%**

Males made up 24 of the 34 participants included in the study, or 70.5% of the study population. Females made up 10 of the 34 participants included in the study, or 29.5% of the study population.

Corresponding information for the general teacher population in Alberta was reported by Alberta Education (1989, p.29) in December 1989, and is shown in Table 3.

Table 3: Alberta Teacher Population Gender and Occupational Position Distribution

CATEGORY	MALE	FEMALE	TOTAL	PERCENT
Teaching	7,310	14,481	21,791	80%
Administration	2,785	1,015	3,800	14%
Other (Consultants, etc.)	549	1,092	1,641	6%
Total	**10,644**	**16,588**	**27,232**	**100%**

Males made up 10,644 of the 27,232 personnel in the general Alberta teaching population, or 39% of the total group. Females made up 16,588 of the 27,232 teaching personnel in the province, or 61%.

When compared in this manner, it can be seen that the study population did not match the general teaching population in gender distribution, but did closely match in terms of the distribution of identified occupational positions (ie. teacher, administrator, etc.).

The following additional data points were collected in order to characterize the study population:

1. Age Grouping
2. Teaching Experience
3. School Origin
4. School Population
5. Teaching Concentration
6. Previous Language Arts Experience
7. Previous Computer Experience

This data was solicited from the study subjects as the literature base indicated that these factors might unduly influence the study results. For example, Workshop attendees might characterize their Workshop experience differently according to their teaching background and experience. By cross-

referencing background data with perceptions of the Workshop itself for each individual, any distinguishing patterns of response would be made more easily apparent.

A report on relevant background factors for the study population follows.

1. Age Grouping:

Respondents were surveyed as to their age at the time they attended the Workshop, according to a 10-year interval scale, beginning at 20+ years and concluding at near retirement age. This is shown in Table 4.

Table 4: Study Population Age Distribution

Age Group	Distribution	Percent of Study Population
20 - 29 years	2	6%
30 - 39 years	14	41%
40 - 49 years	16	47%
50 - 59 years	2	6%
60+ years	0	0%

The bulk of the study population (88%) were in the 30 to 49 age group. This generally compares with the age distribution of the Alberta teaching population for the year 1988-89, as reported by Alberta Education, which was 70.4% of teachers being between the ages of 31 and 50. The median age of the general teacher population was 39.25 for the 1988-89 school year. It must be noted however that a selection effect may have occurred in the response to the survey questionnaire, and for attendance of the Workshop itself. As teachers or other representatives were nominated by their respective jurisdictions for attendance of the Workshop, Workshop participation may not have been representatively drawn from the full range of age groupings. For example, some Superintendents may not have been willing to nominate first-year teachers.

2. Teaching Experience:

Teaching experience was surveyed from the Workshop participants, as it may act as an inhibitor or facilitator in acquiring new knowledge. Inexperienced teachers may respond differently to a new pedagogical approach than might experienced teachers, with specific response being difficult to predict. For example, an inexperienced teacher may be more willing to adopt an educational innovation, as they have had fewer negative experiences in their teaching career to base judgements upon and thus may also have a lower

resistance to change. On the other hand, another inexperienced teacher may be less willing to adopt an educational innovation, as they may lack confidence in their own judgement and may be more willing to accept the status quo. Similar positive and negative responses my be attributable to experienced teachers, influencing their receptivity to educational change, as typified by the Workshop.

This researcher felt that it would be helpful when interpreting the survey results to consider the teaching experience level of the study population, in order to aid in characterizing the receptivity of the group to the innovation under study. For the Workshop study population, the experience distribution was as shown in Table 5.

Table 5: Study Population Teaching Experience

YEARS OF TEACHING EXPERIENCE	NUMBER	PERCENT
Under 2 years	1	3%
3 to 9 years	8	24%
10 to 19 years	19	56%
20+ years	6	17%

The largest proportion of the study population (56%) was teachers with 10 to 19 years experience, indicating that the group as whole had an extensive teaching experience base. This compares with a median of 13.33 years of teaching experience as reported by Alberta Education for the teaching population as a whole (1989, p.87) for the 1988-89 school year. The study population generally reflected the teaching experience levels of the general teacher population in the province of Alberta.

3. School Location (of School of Teacher Origin):

The location of a school may indirectly influence a teacher's receptivity to educational change, particularly if the educational change requires extensive support services. For example, the close proximity of support services available in an urban setting may positively influence a teacher to embrace an educational change. In contrast, the difficulty in accessing support services in a rural setting may act as a deterrent for adopting an educational innovation, particularly one requiring a high level of external support.

The study population categorized the predominant origin of the students in their home schools, and indirectly, the characterization of their school location, as shown in Table 6.

Table 6: School Origin For Study Population

STUDENT ORIGIN	NUMBER	PERCENT
Rural	15	44%
Rural / Urban Mix	12	35%
Urban	7	21%
Total	**34**	**100%**

In its 1989 report, Alberta Education indicated that the four largest (and urban) school districts "had 46.2 per cent of the total provincial enrolment in elementary / secondary schools in 1988-89." (1989, p.16) On this basis, it might seem that urban schools were under-represented in the study population, but this may be untrue. It must be recalled that the Workshop was originally designed and produced for elementary and Junior / Senior High school teachers, and that attendance was on a per-district basis, rather than being based on respective student population levels. With 143 school jurisdictions in the province in 1988-89, the four jurisdictions with the largest student population would represent less than 3% of the total number of jurisdictions, while administering to the needs of 46% of the provincial student population. Suffice to say that the study population represented both rural and urban teachers.

4. Student Population (of Teacher School Origin):

The size of a school student population may indirectly influence a teacher's receptivity to educational change. As schools are funded on a per-student basis, rather than a program basis, small schools may not be able to match the diversity of programs offered by larger schools. This may be particularly important when considering programs tied to the availability of computers. Below a certain threshold number, some computer-based programs such as word processing may become too difficult to efficiently manage. For example, the one-computer per classroom scenario would certainly constrain what a teacher might be able (or willing) to attempt versus a one-computer per student situation.

The study population characterized their home school student population as shown in Table 7.

Table 7: School Population Of Study Population Origin

NO. OF STUDENTS	NUMBER OF RESP.	PERCENT
51 to 99	1	3%
100 to 199	7	20%
200 to 299	6	18%
300 to 399	9	26%
400+	9	26%
Other (District Responsibilities)	2	7%
Total	**34**	**100%**

Student population levels (and hence school size and resources) would not appear to offer an undue influence on the teachers participating in this study. While 52% of the respondents originated from schools having more than 300 students, 42% of the respondents came from schools having less than 300 students.

5. Concentration of Teaching Assignment:

In the initial planning stages of this research study, it was decided to focus on the responses of elementary teachers who had attended the Workshop. Potential study candidates were identified by means of a participant list distributed by Alberta Education. This list was compiled from lists of individuals who had indicated an intention to attend the Workshop as well as those who had attended. In many instances, the list turned out be both incomplete and inaccurate, making precise targeting of elementary teachers difficult. For example, many teachers thought to be elementary teachers due to their designation on the Participant List turned out to be Junior High school teachers who had failed to denote their teaching concentration on the attendance list. For this reason, and in order to preserve an adequate study population, 5

Junior-High respondents were included in the study, along with 5 other administrators and central-office personnel.

Participating teachers were surveyed to confirm their actual teaching concentration at the time they had attended the Workshop. The teaching concentration for the study population is shown in Table 8.

Table 8: Study Population Teaching Concentration

TEACHING CONC.	NUMBER OF RESP.	PERCENT
Grade 1 to 3	1	3%
Grade 4 to 6	23	67%
Grade 7 to 9	5	15%
Principals, Administrators	5	15%
Total	**34**	**100%**

Elementary teachers made up 70% of the population sample, with the remaining 30% made up of Junior-High school teachers and administrators who indicated that they had had some teaching experience at the elementary level, or taught elementary students on a part-time basis. On the basis of this distribution, this study can be said to have an elementary bias, as was intended in the study design. Primary teachers were under-represented by a wide margin however.

6. Previous Language Arts Experience:

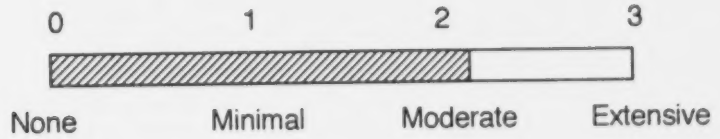
The Workshop was designed to integrate computer word processing into a formalized approach to writing - called the Writing Process. Prior Language Arts experience and training therefore would be very helpful, if not absolutely necessary, in fully contextualizing the information and teaching strategies presented in the Workshop. The study population characterized their prior Language Arts experience as shown in Table 9.

Table 9: Study Population - Prior Language Arts Experience

PRIOR L.A. EXPERIENCE	NUMBER OF RESP.	PERCENT
Minimal	9	26%
Moderate	9	26%
Extensive	16	48%
Total	**34**	**100%**

On a 3 point weighted scale, the prior Language Arts experience of the study population as a group could be depicted as 2.2, lying between moderate and extensive:

Figure 3:



7. Previous Computer Training:

As with Language Arts, facility with computers might have a major influence on the ability of the Workshop attendees to fully contextualize the information and strategies presented in the Workshop. The focus of the Workshop was word processing, so prior experience with word processing would be very helpful in being able to apply workshop knowledge and techniques.

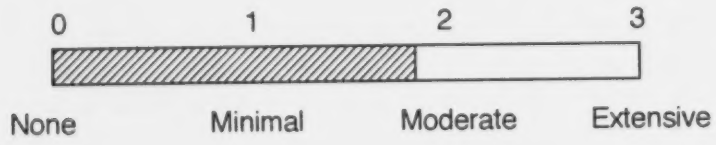
The study population characterized their prior computer experience as shown in Table 10.

Table 10: Study Population - Prior Computer Experience

PRIOR COMP. EXPER.	NUMBER OF RESP.	PERCENT
None	2	6%
Minimal	8	24%
Moderate	17	50%
Extensive	7	20%
	Total 34	**100%**

On a 3 point weighted scale depicting prior computer training or experience, the study population as a group could be characterized as 1.85, being slightly less than "moderate" in computer experience overall.

Figure 4:



8. Prior Computer Application Experience In the Classroom:

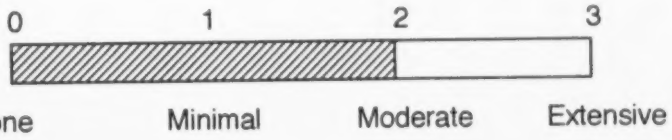
Workshop strategies were intended for application in a classroom setting using computers. As such, prior experience with computer applications in the classroom would aid Workshop participants in fully contextualizing the strategies and information presented in the Workshop. The study population characterized their prior computer application experience in the classroom as shown in Table 11.

Table 11: Study Population - Prior Computer Application Experience

PRIOR COMP. APPLIC.	NUMBER OF RESP.	PERCENT
None	2	6%
Minimal	6	18%
Moderate	16	47%
Extensive	10	29%
Total	**34**	**100%**

On a 3 point weighted scale, the study population as a group measured 2.0, lying exactly on the "moderate" experience level.

Figure 5:



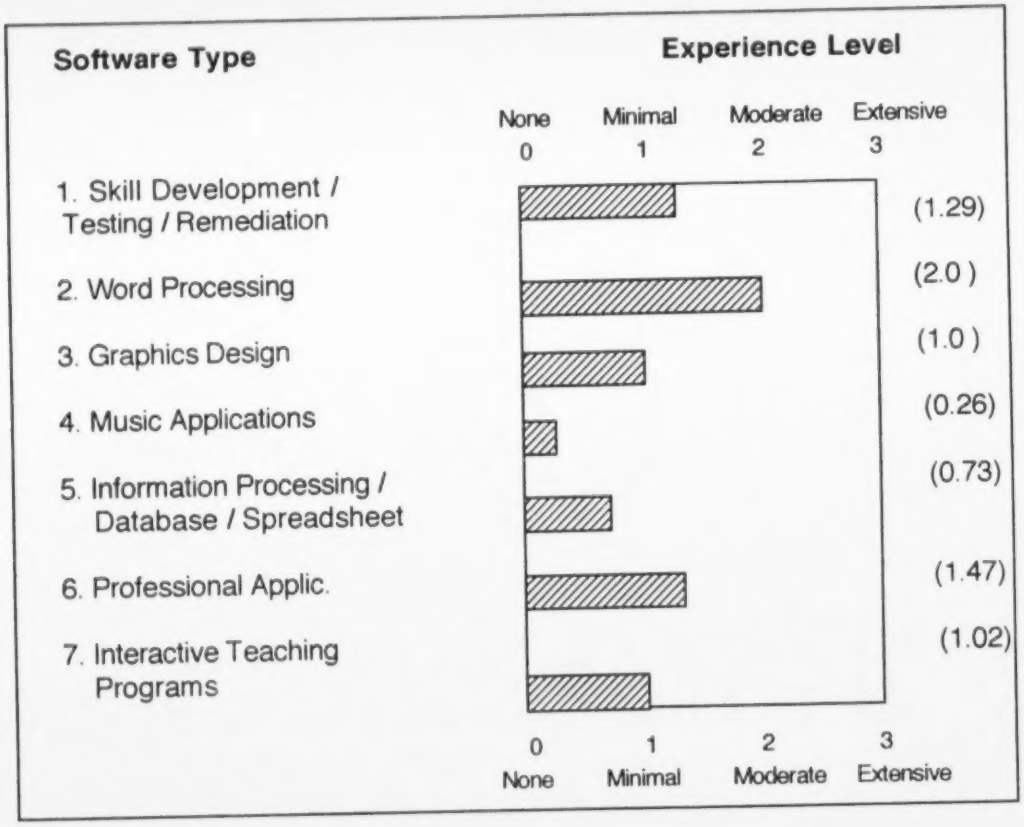
9. Nature of Prior Computer Applications In the Classroom:

While characterizing the level of prior computer application by the study population might be important in determining the receptivity of the Workshop participants to the new strategies presented, the **nature** of that computer experience might be of equal if not greater importance. For example, if the study population had a great amount of prior experience with skill development / testing / remediation software, this might prove to be of little help in assimilating the word processing techniques presented in the Workshop. Conversely, prior experience in word processing would definitely allow the Workshop participants to fully concentrate on the Language Arts aspects of the inservice, requiring little extra effort to cope with the computer word processing demands.

The study population were surveyed as to their prior experience utilizing 7 different types of productivity software, including word processing. A summary of their responses is depicted in graphic form on a 3-point weighted scale for

comparison purposes, as shown in Table 12:

Table 12: Study Population - Prior Experience With Productivity Software



Summary of Study Population Characteristics:

1. Gender Distribution:
The study population did not reflect the gender distribution of the general teacher population. In the study population, men over-represented women in an approximate 2 to 1 ratio, an inverse reflection of the gender distribution in the general teacher population in the province of Alberta at the time the Workshop was conducted.

2. Age Distribution:
The study population generally reflected the age distribution of the general teacher population at the time.

3. Teaching Experience Levels:
The study population generally reflected the teaching experience distribution of the general teacher population at the time.

4. School Origin:
The study population originated from both rural and urban schools.

5. Size of Origin Schools:
The study population originated from both small and large schools, with the predominant group characterized as originating from schools of about 300 students.

6. Teaching Level:
The majority of the study population (70%) were Upper Elementary based.

7. Language Arts Experience Base:
The study population was characterized as having moderate to extensive experience in teaching elementary Language Arts.

8. Prior Computer Experience:
The study population was characterized as having slightly less than moderate prior computer experience and training.

9. Prior Class Experience With Computer Applications:
The study population characterized their application of computers in a classroom program (prior to attending the Workshop) as being moderate.

10. Nature of Prior Computer Experience:
The study population indicated that their most extensive utilization of computers prior to attending the Workshop was for word processing applications.

Part 3: Description of Research Study Time Frame:

This study was initiated in March of 1990 when the Curriculum Support Branch of Alberta Education was contacted. Permission was requested by this researcher to canvass teachers who had participated in the Alberta Education sponsored "The Writing Process Using the Word Processor" series of Workshops in 1988 and 1989. In granting research access, Alberta Education suggested that the respective superintendents of Workshop participants also be contacted. This suggestion was subsequently followed up in May 1990 after formal assent had been received from the University of Alberta Ethics Review Committee to proceed with the research study. Request For Research Access letters were mailed to 76 Alberta school superintendents among whose 106

teachers were listed as having attended the Workshop. These particular teachers were selected on the basis of being identified as elementary teachers, or of not being specifically identified as being Junior / Senior High School teachers or administrators.

Due to the normal summer hiatus of school operations, replies were received from school superintendents from June 1990 until the end of September 1990. A prototype survey questionnaire was concurrently progressively refined with exposure to faculty advisors, graduate student peers, and four selected "evaluators", comprising one experienced elementary school administrator, one experienced elementary teacher who also had doctoral qualifications, and two experienced Junior / Senior High school teachers - one of whom had attended the Workshop as well.

The survey questionnaire was finalized in November of 1990, and copies were forwarded - along with a letter of introduction - to 84 Workshop participants whose school superintendents had granted permission to contact. Fifty-four survey responses were received between December 1990 and March 1991. A preliminary review of the collected data was made in April and May of 1991 by the researcher and by a second "reader" to identify common themes or concerns. This review was followed up by a series of nine telephone interviews with Workshop participants who had agreed to be involved in an interview. The 40 - 70 minute interviews were conducted within an 11 day interval in June of 1991. Survey and interview data was subsequently reviewed, collated and summarized in July and August of 1991.

Part 4: Description of the Survey Instrument:

The survey instrument was designed to collect information in three main areas:

1. Background information about the study population.
2. Characterizations of the perceptions of the study population as to the effectiveness of the learning activities presented in the Workshop, and how applicable these might be to their teacher colleagues.
3. Subsequent application of the Language Arts and computer expertise gained from the Workshop on the part of the participants to their own teaching situations.

Information collected about the background of the respondents was used to help contextualize their responses regarding their perceptions of the effectiveness of the Workshop, and to characterize to what extent the Workshop participants had applied what they had learned to their own teaching situation.

The survey instrument was organized into five main sections:
Part 1: Background Information About the Workshop Participants
Part 2: Participant Perceptions About the Workshop
Part 3: Teaching Implications of Having Participated In the Workshop
Part 4: Personal Written Response
Part 5: Request For A Personal Interview

Part 1:

Part 1 of the survey instrument was made up of 14 questions, collecting information on 20 distinct data points. These questions were used to characterize the respondents with regards to:

a) age
b) teaching experience
c) school location
d) school student population
e) teaching assignment
f) experience in teaching Language Arts at the Elementary level
g) experience with computers
h) attitudes towards computer integration into Language Arts
i) organizational support for computer integration both prior to and subsequent to attending the Workshop
j) personal importance ascribed to integrating computers into Language Arts teaching
k) report on opportunity to inservice others on Workshop techniques and strategies.

These questions were presented in a check-off format for ease of response.

Part 2:

Part 2 of the survey instrument dealt with the perceptions of the respondents regarding the effectiveness of certain format aspects of the Workshop, as well as an overall evaluation of the effectiveness of the Workshop format in facilitating educational change. Nineteen distinct data points were surveyed in this section of the questionnaire, presented in an agree-disagree spectrum characterized by a 5 point circle-the-answer scale.

Part 3:

Part 3 of the questionnaire focussed on characterizing the participants' application of the knowledge and expertise gained from the Workshop, and on identifying difficulties in applying that knowledge. Seven data points were surveyed in a check-off format.

Part 4:

Part 4 of the survey instrument provided an opportunity for the

respondents to make more elaborate comments in written form about the inservice format, or to make suggestions about alternatives to inservicing to facilitate educational innovation. Twenty-four out of the thirty-four respondents (70%) took advantage of this opportunity to make additional comments, although many were about specific Workshop features rather than more generalized comments.

Part 5:

Part 5 of the survey instrument requested permission to contact the respondent in order to arrange for a personal telephone interview to allow for further elaboration and discussion about the respondent's Workshop experiences. Thirteen of the thirty-four respondents (38%) agreed to participate in an interview session. This researcher was subsequently able to conduct interviews with nine of the respondents - 26% of the study population.

Description of Follow-Up Interview Inquiry:

Follow-up telephone interviews were conducted with 9 of the 34 (26%) questionnaire respondents. Telephone interviews were conducted due to the wide geographic dispersion of the respondents, making in-person interviews impractical due to the travel costs involved, and the time required. The interviews that were conducted were of the semi-formal type, with clarifications of survey responses (where needed) requested, along with response to six additional aspects of the Workshop, comprising:

1. Identification of which specific Workshop session the respondent had attended (i.e. Edmonton, Calgary, etc.)

2. Explanation of how the respondent came to be involved with the Workshop (i.e. selected, volunteered, requested, etc.)

3. Elaboration of the respondent's expectations of the Workshop (if any), prior to actual attendance.

4. Characterization of the respondent's personal response to two specific aspects of the Workshop, what sort of balance they felt was established in the Workshop between theory and practice, and how they viewed the duration of the Workshop in terms of its' effectiveness (i.e. too long, too short, of satisfactory length, etc.).

5. Characterization of what the respondent felt were the long-term effects - both positive and negative - on his or her teaching practice of having attended the Workshop.

Description of Data Collection Methods:

Data was collected by means of an 11 page - 40 question survey instrument seeking information concerning 48 separate data elements. This data base was supported and reinforced by an additional 9 telephone interviews with those respondents who had indicated a willingness to participate.

Data collection was hampered in this study however by a number of factors:

1. The Length of Time That Had Elapsed Since the Participants Had Attended the Workshop Sessions:

In most cases, two years, and with some respondents, three years had elapsed since they had attended the Workshop sessions. This was a concern on the part of the researcher not so much regarding the ability of the respondents to recall specific features of the Workshop, as the study would focus on the long-term effects, but on the mobility of the participants themselves. Some of the teachers contacted had retired from teaching, others had changed school jurisdictions or jobs, while still others were no longer working in a classroom teaching situation. Nonetheless, 54 of the 84 individuals (64%) contacted responded to the survey.

In addition, since a number of school superintendents had changed or been promoted since the Workshop had been held, many were unaware of the participation in the Workshop on the part of teaching personnel from their jurisdiction. Understandably, some superintendents were reluctant to allow this researcher to contact the teachers requested.

2. The Ambiguity of the Workshop Participant's List:

As noted in a previous section, the Workshop Participants' List contained many inaccuracies or lacked adequate information about the participants. In many instances mailing addresses were incomplete, precluding contact by mail. A number of teachers also failed to indicate such information as their teaching concentration (ie. elementary vs. Junior / Senior High) or position, and which jurisdiction they worked in. This necessitated the researcher contacting the Workshop participants through their respective school boards, a circuitous and inefficient procedure. Thirteen of the 106 (12%) potential candidates for inclusion in the study were directly eliminated as their survey correspondence was returned "Address Unknown."

3. The Involvement of Three Levels of Educational Bureaucracy:

As this study required contact with teachers who had attended an Alberta Education sponsored inservice, official sanction to contact the participants had to be sought from the appropriate Alberta Education department officials prior to

initiating the study. Subsequently, permission also had to be obtained from each teacher's respective school superintendent to allow them to be contacted. Finally, the teachers themselves had to be canvassed to determine whether they wished to participate in the study. This multiplicity of bureaucracy extended the time that it took to conduct the study, and compounded the problems normally encountered with a survey-based study.

4. The Geographic Dispersion of the Respondents:

As had been outlined earlier, the participants in this study were drawn from the entire province of Alberta. While not a factor in the mail-back survey data collection stage of the study, the wide geographic dispersion of the respondents created difficulties for the interview stage of the study. The interviewees were an average of 400 km from each other, and 600 km from this researcher, making in-person interviews prohibitive in terms of travel costs and time requirements. This necessitated a telephone-interview approach. It should be noted that while two of the respondents were within one day's travel of the researcher, it was felt that it would be better to conduct all of the interviews by telephone in order to preserve the integrity (and comparability) of the results.

5. The Time Constraints Imposed By the School Year:

Access to the study population was not unrestricted, as the participants were effectively only accessible during the normal school year. School holidays and vacation breaks effectively reduced the access time to approximately nine months per year, providing a disjointed time-line for study completion. For example, when respective school superintendents were first approached in May 1990 concerning permission to conduct the study, many did not in fact respond to the research request until September of 1990, imposing a three month delay in progression to the next stage of the study - contacting the Workshop participants themselves. Similar delays were incurred during the questionnaire mail-out / data collection stage, due to Christmas holidays and various semester breaks. As a teacher myself, I did not wish to impose on the Workshop attendees during their vacation or personal time.

6. Access Restrictions Due to Teaching Load:

Nearly all of the interview participants were full-time teachers or administrators who provided their school or office telephone numbers for contact. The researcher was also a full-time teacher at the time the study was conducted, creating problems in not just contacting the individuals who expressed an interest in participating in an interview, but also in determining a mutually agreeable interview time.

This access difficulty was somewhat ameliorated by the participants'

willingness to accommodate the researcher. For example, some interviews were conducted during lunch breaks or out-of-class times. Other interviews were conducted on the participants' own time, including an interview with one dedicated teacher on a Saturday morning. The researcher was impressed with the attitude manifested by all of the interviewees contacted. Many rearranged their personal schedules in order to participate in interview sessions. As a group, they demonstrated a strong willingness to help in the research process, and were both frank and eloquent in their responses.

Description of Data Analysis Procedures:

Both questionnaire and interview response data was collected in the course of this study. Questionnaires were initially checked to determine if they satisfied the criteria for inclusion in the study population. Of the 54 questionnaires received back from the survey mail-out, 20 were rejected as not being suitable for inclusion in the study. Among the reasons for exclusion were:

1. The respondent had not actually attended the Workshop, even though their name had appeared on the Workshop Participant List.
2. The respondent had not completed the questionnaire, or had left many sections blank without any explanation being provided.
3. Incorrectly identified respondents. Some Senior High School teachers and administrators were incorrectly denoted as elementary based. In other cases, no identification as to teaching level was provided.

Ultimately, after all of the questionnaires had been screened, 34 questionnaires remained for inclusion in the study population.

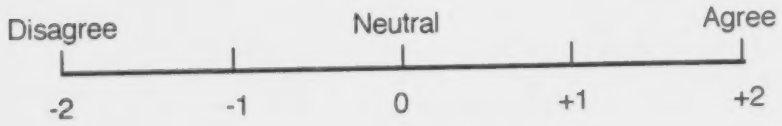
Actual data analysis began with establishing a computer database for the survey questionnaire responses. Categories for each data element (question or sub-question) were created in an AppleWorks database master file. The responses to each data-element for each individual respondent were then appropriately recorded. This computer organizer facilitated the consolidation of all of the data collected from all of the respondents into one master file, providing the researcher with the ability to easily organize, compare and cross-reference respective responses. Preliminary print-outs were then made of all of the data entered in a spreadsheet format, with an identifier attached to corresponding entries for each respondent. Numerical tallies were subsequently made for group responses to each question in the survey - each data column - and converted to percentages for ease of interpretation. This data was also converted to pie and bar-graph representations, one and sometimes two different kinds for each data element category tally. The objective for doing this was to provide another way of looking at and interpreting the data, seeking hidden trends or commonalities.

One additional interpretive tool was created as well. For questions that shared a common response technique (ie. a characterization of None, Minimal, Moderate, and Extensive), a weighted horizontal scale was created. This was facilitate easier characterization of the group response, as opposed to individual responses.

Three different scales were created and are duplicated below for illustrative purposes:

Figure 6: Agreement Scales:

Version 1:



Version 2:

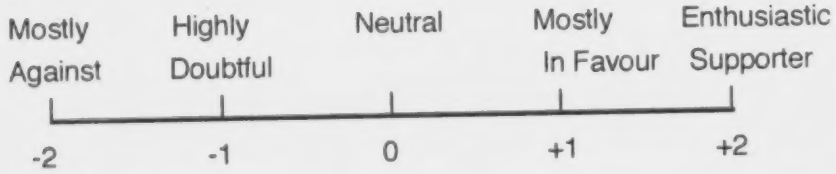
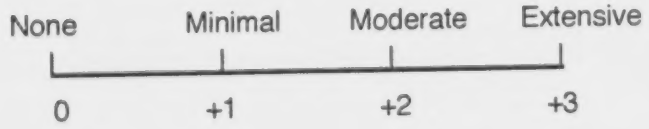


Figure 7: Frequency Scale:



Written comments and responses were collected from the survey questionnaires and were transcribed and recorded on a word processing file. This offered two advantages:

1. All comments were translated into printed text, eliminating difficulties in reading comments in cursive writing. This also removed the potential for evaluating the comments on the basis of their appearance, rather than their content as was intended.

2. Printed text could be more efficiently collated, compared, stored, and retrieved at a later time.

A similar transcription strategy was adopted for the interview records. Prior to the interviews, a specific interview format was created from common themes emerging from the questionnaire data. Each interview consisted of two parts:

1. Clarification of questionnaire responses, and . . .
2. Response to seven specific inquiries.

As the same interview format was used for each individual contacted, comparison and contrast of the group responses was enhanced.

Final data analysis was a blend of the two data collection techniques employed - the survey questionnaire and the personal interviews. Questionnaire and interview data were used to support one another. In both cases, and particularly with the questionnaire data, qualitative aspects were stressed. The intent of the analysis effort (and the study as a whole) was to formulate a characterization of the Workshop participants' response to inservice techniques employed, rather than the establishment of a precise numerical stimulus-response type of evaluation.

Conclusion:

In the this chapter, I have outlined and discussed that:

1. Inservice was chosen as the research focus of this study.

2. An Alberta Education sponsored inservice program - "The Writing Process Using the Word Processor Workshop" was chosen as a research base.

3. Thirty-four Workshop participants were chosen as research subjects.

4. With the exception of gender ratio, the study population was generally representative of provincial teaching population of the time. Seventy percent of the subjects were elementary teachers.

5. The study was initiated in 1990, with data collection conducted by means of mail-out questionnaires and follow-up telephone interviews. Substantial difficulties were encountered in collecting data for the study.

6. Data analysis was begun in 1991, supported by both quantitative and qualitative data.

Chapter IV: Analysis of the Data

Introduction:

Data for this research study was collected by means of a mail-out survey questionnaire followed up by selective telephone interviews. In this chapter, I intend to:

1. Examine participant response - both individually and as a group - towards the various components of the survey questionnaire.

2. Review supporting data collected by means of telephone interviews.

3. Collate and compare various elements of the study data base.

Survey Questionnaire Data:

As has been previously stated, the survey questionnaire gathered information concerning three main aspects of the Workshop experience:

1. Background information about the Workshop participants.

2. Participant perceptions of the effectiveness of the learning activities presented in the Workshop.

3. Subsequent participant application of Workshop expertise and knowledge in their own teaching situations.

This information was gathered in order to:

1. Characterize the population of the study so as to aid in generalizing results to the teacher population as a whole.

2. Gain an insight into the participants' evaluation of the effectiveness of collaborative-interactive inservice techniques.

3. Form an estimation of whether this particular type of collaborative-interactive inservice benefited the study population in the long term - years as opposed to days, weeks, or months after attendance.

In Part 1 of the survey questionnaire, background Information was requested of the Workshop participants concerning their:

1. Age
2. General teaching experience

3. School location and student population
4. Teaching concentration
5. Prior teaching experience in Elementary Language Arts
6. Prior computer training and/or experience
7. Prior application of computers in their classroom programs
8. Utility of specific computer software applications

This information was gathered in survey questions 1.00 to 1.08 and was reported earlier in this study in the Description of the Study Population. The second part of the questionnaire section, comprising questions 1.09 to 1.13, sought to characterize the participants' attitudes and commitment towards, and the organizational support provided for, computer integration in their respective classroom programs prior to their attendance of the Workshop. Detailed reports of the participant responses for these aspects are reported in the following section.

Question 1.09: "Characterize your attitude towards computer integration into your classroom Language Arts program prior *to* your involvement in the Workshop."

This question was included in the survey questionnaire to gain some sense of the overall receptivity of the study population to educational change, and in this specific case, the concept of computer integration in the area of Language Arts instruction. If Workshop participants had a negative attitude towards the concept of computer integration, their willingness to accept the Workshop activities and strategies which stressed computer integration would be compromised or even inhibited. Polling individual's attitudes towards this aspect was also considered important on the part of this researcher for the sake of the Workshop group dynamics. As Workshop participants had been expected to work with a partner in small group situations, individual attitudes, if negative, could affect group dynamics, and ultimately influence group receptivity to adopting the innovation promoted - in this case, computer integration. Individual and group characterizations are represented in Table 12.

Analysis:

The overall positive attitude towards computer integration demonstrated by the study population was not surprising, considering that the original intent of the Workshop was to train inservice leaders in process writing using word processing. Personnel demonstrating a negative attitude towards computer integration would not have been selected to attend the Workshop, nor would they have volunteered to attend if that was their choice. Why would someone commit themselves to an enterprise demanding preparation, commitment and

time, when they did not believe in it? What is perhaps unexpected however was the number of participants (47%) who characterized their attitude towards computer integration as "Mostly In Favour" or "Neutral." One might have expected an even larger majority of the participants to be enthusiastic supporters, given the focus of the Workshop, and the fact that the participants had been selected by their own jurisdictions to attend.

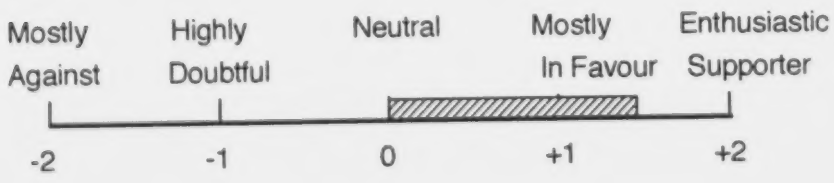
In contrast however, it is also significant that there were no individuals surveyed who had a negative attitude towards computer integration. In this manner, a potential inhibitor group towards adoption of the "innovation" presented in the Workshop was avoided.

Table 13: Study Population - Prior Attitude Towards Computer Integration

Individual Responses:

CATEGORY	NUMBER OF RESP.	PERCENT
Mostly Against	0	0%
Mostly Doubtful Of Utility	0	0%
Neutral Feelings	4	12%
Mostly In Favour	12	35%
Enthusiastic Supporter	18	53%
	Total 34	**100%**

Figure 8: Characterization of Group Response: (+1.4)



Analysis (Continued):

In terms of receptivity to change, the Workshop could not however be characterized as an exercise in "preaching to the converted." While perhaps more "bullish" on computers than what the general teacher population might be - 53% of the study respondents characterized themselves as "Enthusiastic Supporters", they cannot be described as a monolithic computer "fan club." In essence then, the study population can be said to be somewhat more positive towards computer integration than the general teacher population, but not overwhelmingly strong in their support.

Question 1.10:

"Characterize the amount of support (program flexibility, computer hardware, software, administrative and collegial support, etc.) that you had available to you in your teaching situation in order to integrate computers into your classroom Language Arts program, prior to your participation in the Workshop."

Sufficient and sustained support is critical to the success of any innovation effort, and this holds true for inservice initiatives. This particular question, however, sought to canvass the respondents' characterization of the support they had received for their computer efforts prior to their attendance of the Workshop. Computer innovation is somewhat more fraught with difficulty in this aspect than other types of educational change, as computer innovation cannot proceed without sufficient hardware, software and personnel resources. Provision of adequate resources to the task demanded is made more difficult due to the relatively high cost associated with computers and their related support components (training, maintenance, etc.). While traditional educational innovations such as the introduction of a new curriculum do incur substantial costs, computer innovation adds expensive hardware and software costs to the total cost equation. In more specific terms, if an individual had not received adequate support in prior computer efforts, they would be more likely to be skeptical as to the advisability of another computer associated innovation effort, such as that represented by the Workshop. This lowered receptivity to the promoted change would directly impinge on the individual's willingness to adopt the innovation, calling into question the potential for the ultimate success of the effort. Individual and group response to this question is reported in Table 14.

Analysis:

As greater than three-quarters of the study population characterized the support that had been provided to them prior to their attendance of the Workshop as being moderate to extensive, the support issue appears (from this data) not to be a major concern affecting receptivity. The overall support level could be expressed as 1.82 on a 3 point scale, and characterized as slightly less than moderate for the group. This might be considered optimal for a group

prior to exposure to an inservice on a related but new innovation. Individuals who had experienced little or no support in prior computer innovation efforts might have begun the Workshop with a disillusioned attitude, convinced that the innovations presented in the Workshop would require further improvisation as well as extra work and effort on their part. This could be construed as a definite inhibitor to positive adoption of the innovation. Conversely, individuals who had received extensive support in previous innovation efforts might become frustrated if similar or better support levels were not provided as part of the innovation effort represented by the Workshop.

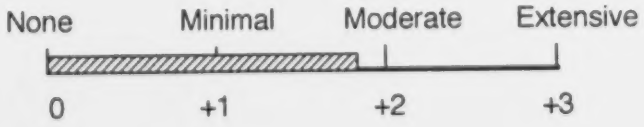
From the data collected by this particular question, it appears that this was not a relevant concern. Only four of the thirty-four respondents (12%) characterized their prior support as being non-existent or at the other end of the spectrum, extensive. The majority of the study population would not have the resource issue as an important determinant in their receptivity to the innovations presented by the Workshop.

Table 14: Amount of Support Provided In Prior Computer Integration Efforts

Individual Response:

SUPPORT CHARACTERIZATION	NO. OF RESP.	PERCENT
No support	1	3%
Minimal Support	7	21%
Moderate Support	23	68%
Extensive Support	3	8%
Total	**34**	**100%**

Figure 9: Group Characterization: (+1.82)



Question 1.11: "Prior to attending the Workshop, what importance did you assign to integrating computers into your classroom Language Arts program?"

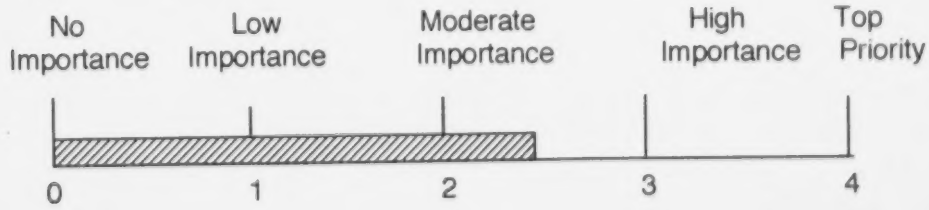
This question was included in the survey to attempt to gauge the commitment the study population felt towards integrating computers into the classroom program. While this attitude (positive, negative, or neutral) might give some indication of possible response towards an innovation, it might also indicate a past commitment towards efforts of a similar nature. In this manner, the receptivity of the study population might be estimated in an indirect way. If, for example, an individual already ascribed high importance towards integrating computers in the classroom program, then the chances of that person adopting an innovation related to the same concept would be much improved. Conversely, if an individual ascribed little or no importance to implementing computer integration in their classroom program prior to attending the Workshop, then the possibility of the inservice effort doing so might be reduced.

Table 15: Prior Ascribed Importance to Integrating Computers In Classroom Program

Individual Response:

ASCRIBED IMPORT.	NO. OF RESP.	PERCENT
No importance	0	0%
Low Importance	6	18%
Moderate Importance	10	29%
High Importance	15	44%
Top Priority	3	9%
Total	**34**	**100%**

Figure 10: Group Response: (+2.4)



Analysis:

Prior to attending the Workshop, 25 of the 34 respondents (74%) characterized their feeling about the importance of computer integration as being "Moderate" to "High". In contrast, 26% felt that computer integration was of "Low Importance" or, alternately, of "Top Priority". The later statistic supports the view created in other responses gathered in the study, in that the study population was neither totally convinced of the utility of computer integration, nor entirely skeptical. The weighted group score reported above confirms this estimation, showing the group as judging the importance of computer integration as "Moderately High." This evaluation also shows that while the study population were perhaps more amenable to computer integration than the general teacher population might be expected to be, they were not as convinced as might be expected for a selected group of computer enthusiasts. Essentially, these results show that there was potential to positively change the affect of the study population towards the concept of computer integration, with some commitment still reserved.

Question 1.12: "Characterize the amount of support (program flexibility, computer hardware, software, administrative and collegial support, etc.) that you had available to you in your teaching situation in order to integrate computers into your classroom Language Arts program following your participation in the Workshop."

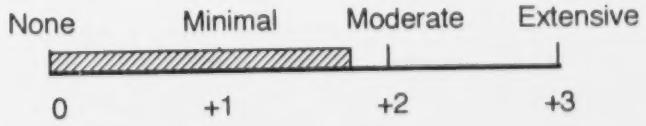
This question was included to enable a comparison to be made with characterization of support prior to attendance of the Workshop. Innovation efforts are often accompanied by the provision, or at least the expectation of new or higher levels of support. Expectations realized would tend to contribute towards the overall success of the innovation effort, while expectations denied would hinder the adoption process. In the case of the Workshop, expectations were heightened in the minds of both the participants and the associated local school jurisdictions due to the nature of its' sponsorship by Alberta Education. In their written comments or interview replies, some respondents indicated that this perceived expectation - particularly on the part of school superintendents, actually contributed towards situations where some school jurisdictions provided even less money for computer acquisition and support than they had before, feeling that Alberta Education would be providing increased funding for this.

It must be noted here that the two support-related questionswere spatially separated by a different type of question. This was done to avoid creating confusion on the part of the respondent, as the questions differed only in the "before" and "after" the Workshop designation. It was hoped that this would ensure a more accurate response.

Table 16: Individual Response: Characterization of Support Provided For Computer Integration Following Attendance of the Workshop

CHARACTERIZATION	NO. OF RESP.	PERCENT
No Support	0	0%
Minimal Support	12	35%
Moderate Importance	16	47%
Extensive Support	6	18%
Total	**34**	**100%**

Figure 11: Group Response: (+1.82)



Analysis:

All of the respondents reported that they had received some measure of support for computer integration following attendance of the Workshop. Twenty-two of thirty-four respondents (64%) characterized their post-Workshop support as "Moderate" to "Extensive." This compares with 26 of 34 respondents (76%) who characterized the support that they had received prior to attending the Workshop as being "Moderate" to "Extensive." This was a net reduction of perceived support of 12%.

When compared using the weighted group scale however, the Before and After characterizations were identical, at +1.82, slightly less than "Moderate" support provided overall. How to resolve this apparent contradiction? It appears that while the overall group characterization did not change, the

distribution of the individual responses did change. For example, 7 of the 34 respondents (20%) characterized the support that they had received prior to the Workshop as being "Minimal." This particular category increased to 12 of 34 respondents (35%) for the period after the Workshop. Conversely, while 23 of 34 respondents (67%) characterized their support as "Moderate" prior to the Workshop, this decreased to 16 of 34 respondents (47%) for the period succeeding the Workshop.

In overall terms, 11 of the 34 study respondents (32%) reported changes in the level of support they had received for computer integration following their attendance of the Workshop. Five respondents reported their support to have increased after attending the Workshop, while six respondents surprisingly enough reported an actual decrease in support. Those who reported an increase in their support levels were equitably distributed between males and females, rural and urban based. The reduced-support group however, while generally balanced between urban and rural origin, were exclusively male.

In an attempt to find any further correlations, support characterization was compared to the respondent's teaching position, and to the population of their school base. A simple weighted scale was used to aid in comparing the characteristics. The increased-support group was calculated to be at 3.0 on the scale - corresponding to a school having a population of 300 to 399 students. In contrast, the decreased-support group was calculated to be at 3.4 on the comparison scale, corresponding to a school having a population closer to the 400+ range. When examining teaching position as a possible factor, the Increased-Support Group almost exclusively originated from the Gr. 4 - 6 level, while the Decreased - Support Group was mostly Junior-High based.

Since all of these comparisons were based on such a small sample however, 11 of the 34 respondents, the calculated differences may be more an artifact of the small sample size rather than a generalizable trend.

Question 1.13: "The original intent of the Workshop was to inservice teacher-leaders on inservicing techniques applicable to the introduction of process writing using computers. Did you personally have the opportunity to inservice other teachers in your jurisdiction? Characterize your own experience."

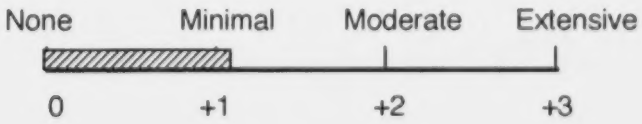
This question was included in the questionnaire to provide some estimation of the efficacy of the "trickle down" model of inservicing, whereby a select group of inservice attendees are expected to share their knowledge with their peers. The Workshop was based on this model, and it might be useful to compare the participants' perceptions of how effective the inservice was as a means of introducing innovation to their own teaching, as opposed to its' effectiveness as a "transmission vehicle" for others. In essence, the participants could not expect

to effectively communicate the knowledge and techniques presented during the Workshop to others if they themselves had not had some experience in applying them to their own teaching.

Table 17: Individual Response: Characterization Of the Amount of Inservicing That Was Performed By the Respondents After Attendance of the Workshop

AMOUNT OF INSERVICING	NO. OF RESP.	PERCENT
No Inservicing Was Performed	9	26%
Minimal Inservicing	14	41%
Moderate Inservicing	8	23%
Extensive Inservicing	3	10%
Total	**34**	**100%**

Figure 12: Group Response: (1.15)



Analysis:

From the response of the study population, it appears that the primary intent of the Workshop was not fulfilled to any great degree. Twenty-three of the thirty-four respondents (68%) reported that they performed "Minimal" or "No Follow-Up Inservicing" for their peers in their home school jurisdictions. Only three respondents (9%) reported that they were able to conduct extensive inservice efforts.

This was a major shortcoming of the Workshop, and one that must weigh heavily in the overall evaluation of the worth of the of the "trickle down" approach in facilitating staff development.

Analysis of Part 2 of the Survey Questionnaire Responses:

Part 2 of the survey questionnaire was composed of a series of statements concerning various design and format aspects of the Workshop. The intent of this part of the survey was to gain some sense of what the participants felt were effective and not so effective elements of the Workshop design. Response was also requested from the participants concerning design elements which they felt might have been improved in effectivenss, as well as suggestions about the nature of possible improvements.

To facilitate ease of data collection, respondents were instructed to indicate their agreement or disagreement with a series of declarative statements using a 5 point scale, which ranged from Strongly Disagree to Strongly Agree.

Question 2.00: "I gained a lot of useful information from my exposure to computer applications for Elementary language arts."

Although this question was posed to gain an overall impression of the participants' valuation of the Workshop, analysis of the response was more complicated than might be superficially evident. Interpretation of response to this question may be significantly dependent upon:

1. The Expertise level of the Respondent In Computer Applications For Elementary Language Arts Prior To Attending the Workshop.

For example, an enthusiastic user of computer applications in elementary language arts might respond that they had not learned much from the Workshop, as they were already fully employing the techniques presented. Alternately, someone who had little computer experience might respond that they had not gained much from attending the Workshop, as they lacked the skills to utilize the information presented.

2. The Instructional Contact the Respondent Had With Elementary Students

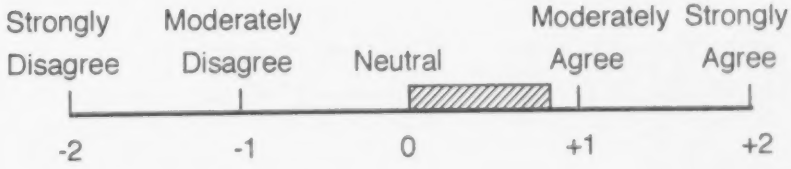
A participant may not have been an elementary teacher, or if an elementary teacher, may not have been involved in teaching language arts. This would affect their response to this particular question as they might not find the information presented in the Workshop relevant to their personal teaching (or non-teaching) situation.

In this manner, a negative response to this survey question on the part of a respondent might not necessarily indicate a weakness or failing in the Workshop design itself, but be more indicative of situational factors.

Table 18: Individual Response: Characterization of Workshop Utility - Computer Applications For Language Arts

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	0	0%
Moderately Disagree	2	6%
Neutral Feelings	10	29%
Moderately Agree	13	38%
Strongly Agree	9	27%
	Total 34	**100%**

Figure 13: Group Response: Degree of Agreement (+0.85)



Analysis:

While 22 of 34 respondents (65%) characterized their response to this question as moderate to strong agreement, the remaining 35% indicated neutral feelings or moderate disagreement. Closer scrutiny of the responses, grouped according to prior experience with word processing, and to teaching position, produced the following characterizations:

Table 19: Response According To Prior Word Processing Experience

PRIOR W. P. EXP.	GROUP RESPONSE
None	+1.16 (Slightly better than Moderate Agreement)
Minimal	+0.33 (Tending Towards Neutral feelings)
Moderate	+1.0 (Moderate Agreement)
Extensive	+0.55 (Between Moderate Agreement and Neutral feelings)

When this information is plotted in graph form, a trend line can be discerned. It appears that those participants who had no prior word processing experience felt that they gained more from the Workshop than those who had moderate to extensive. W.P. experience. The higher the level of prior word processing experience, the less the respondents felt they gained from the Workshop in terms of knowledge and expertise. This observation would confirm a common sense expectation. Individuals who began the Workshop with a high level of prior word processing experience might be expected to gain less than someone who had little or no experience, especially since the Workshop was focussed on word processing applications.

It must be noted that the response of the Minimal W.P. experience group did not follow the apparent trend line. Perhaps, due to the fact that this characterization was based on the response of only three individuals, individual differences within the group obscured or negated any group trend.

Table 20: Response According To School Position:

SCHOOL POSITION	GROUP RESPONSE
Gr. 4 - 6 Teacher	+1.0 (Moderate Agreement)
Gr. 7 - 9 Teacher	+0.66 (Reserved Agreement)
Administrators / Consultants	+0.6 (Reserved Agreement)

When this data is graphed, an apparent trend is evident once again. It appears that as a group, the Gr. 4 - 6 Teacher participants felt that they had gained more from the Workshop than their Gr. 7 - 9 Teacher or Administrator colleagues. This conclusion may be misleading however, as by design, the study population was primarily composed of elementary teachers (66%), and were twice as well represented. On this basis then, no definitive conclusion can be drawn from this data in isolation.

Question 2.01: "I felt that the teaching strategies demonstrated during the Workshop were applicable to my teaching situation."

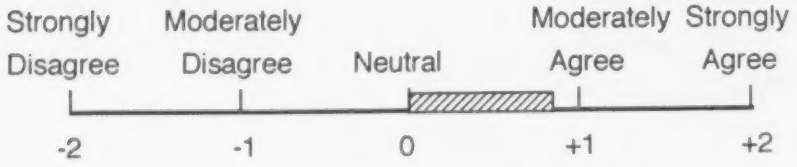
This question was included in the survey questionnaire to gauge the situational match between the intended target group of the Workshop and that of the actual Workshop participants. The closer the match, that is, the more relevant the inservice is to the situational background of the participants, the greater potential there is for the participants to adopt the innovation being promoted. In an indirect manner, this was another way of establishing the potential receptivity of the Workshop participants towards the Workshop innovation - utilizing computer word processing for process writing development.

Table 21: Individual Response: Agreement of Applicability of Workshop Teaching Strategies To Teaching Situation

Note: Thirty-two responses were included in the analysis for this question. Two responses, those of the district consultants who attended the Workshop, were excluded, as they were not directly involved in a teaching capacity.

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	1	3%
Moderately Disagree	3	9%
Neutral Feelings	7	22%
Moderately Agree	12	37%
Strongly Agree	10	29%
	Total 32	**100%**

Figure 14: Group Response: Characterization of Agreement - Teaching Strategies Demonstrated In the Workshop Were Applicable To Teaching Situation (+0.84)



When the data for the Gr. 4 - 6 and Gr. 7 - 9 Teachers was separated from the composite, the following characterizations emerged:

Table 22: Comparison of Responses For Gr. 4 - 6 and 7 - 9 Teachers

SITUATION	GROUP RESPONSE
Gr. 4 - 6 Teachers	+1.09 (Slightly Above Moderate Agreement)
Gr. 7 - 9 Teachers	+0.5 (Reserved Agreement)

Analysis:

As with Question 2.00, a difference in characterized response emerged between those of the Elementary teachers and Junior-High teachers. Elementary teachers felt that the teaching strategies demonstrated during the Workshop were more applicable to their teaching situation than did the Junior-High teachers. For this particular question however, the responses for the Elementary teachers outnumbered those of the Junior-High teachers by an approximation of 3 to 1, once again calling into question the validity of the contrasting responses for the respective groups.

The overall characterization for this question by all of the respondents can be assumed to be more accurate. The +0.84 weighted response would translate to a level slightly below that of "Moderate Agreement" for the question as stated in the survey. This indicates that the relevancy of the Workshop - the match between the teaching situations presented and their applicability to the respondents was good, but not superior.

Question 2.02: "I felt that the teaching strategies demonstrated during the Workshop were applicable to the teaching situations of many of my colleagues."

This question was included in the survey questionnaire for three purposes:

1. To act as somewhat of a cross-check on the response given for Question 2.01.

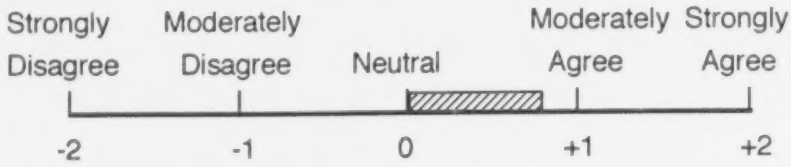
2. To translate the question from personal affect to a less threatening, more removed target group. Question 2.01 requested a response characterization based on an estimation of the personal relevancy of the Workshop. In contrast, Question 2.02 asked for a response characterization based on the relevancy of the Workshop to teacher colleagues.

3. To gain an estimation of the "transferability" of Workshop teaching strategies to other potential teacher audiences. It should be recalled that Workshop teaching strategies were primarily intended to be communicated to other teachers through the Workshop attendees - in the manner of a cascade. If the participants themselves did not view the teaching strategies demonstrated in the Workshop to be particularly relevant to their teacher colleagues, then their subsequent motivation for inservicing others, or even adopting the innovation themselves, would be diminished.

Table 23: Individual Response: Workshop Teaching Strategies Were Applicable To Teaching Situations of Colleagues

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	0	0%
Moderately Disagree	2	6%
Neutral Feelings	9	26%
Moderately Agree	17	50%
Strongly Agree	6	18%
	Total 34	**100%**

Figure 15: Group Response: Characterization Of Agreement That The Teaching Strategies Applied To The Teaching Situations of Teacher Colleagues (+0.79)



Data for individual groups, Gr. 4 - 6 Teachers, Gr. 7 - 9 Teachers, and Administrators, are shown in Table 24.

Table 24: Comparison of Group Response For Gr. 4 - 6 and 7 - 9 Teachers, and Administrators

PARTICIPANT GROUP	GROUP RESPONSE
Gr. 4 - 6 Teachers	+1.0 (Moderate Agreement)
Gr. 7 - 9 Teachers	+0.43 (Reserved Agreement)
Administrators	+0.5 (Reserved Agreement)

Analysis:

As in Question 2.00 and 2.01, Elementary teachers among the study population showed the greatest agreement with the stated question. Junior-High teachers and administrators were much more reserved in their agreement. It is interesting to note that the Gr. 7 - 9 teachers and the administrators nearly matched in their characterizations, adding to the probability that this was a real, as opposed to an apparent difference in perception on the part of the various participant groups. While statistical influence cannot be dismissed as possibility, the results would seem to indicate that Elementary teachers felt that they could better apply the teaching strategies demonstrated in the Workshop than their Junior-High or administrator colleagues. This could be interpreted as an indicator of the effectiveness of the Workshop design, as the Workshop had been intended to be targeted at Elementary teachers.

Comparisons between the responses given in Question 2.01 and 2.02 also show good agreement, strengthening the credibility of the overall

characterization for this issue. This is illustrated in Table 25.

Table 25: Comparison of Group Responses

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION		
	Question 2.01	Question 2.02	Difference
Gr. 4 - 6 Teachers	+1.09	+1.0	0.09
Gr. 7 - 9 Teachers	+0.5	+0.43	0.07

As can be seen by the results shown in Table 25, the results for both questions were essentially duplicated, indicating that the respondents did not make any appreciable differentiation between gauging the relevancy of the Workshop to themselves or their colleagues. It should also be noted that in the case of both groups, the agreement characterization was positive.

Question 2.03a: "The hands on approach employed during the Workshop really raised my confidence level in applying the Language Arts techniques demonstrated [in the Workshop] to my teaching."

One of the characteristic design features of the Workshop was the utilization of a significant amount of "hands on" type activities - an identifying component of interactive / collaborative type inservices when contrasted with the more traditional didactic lecture type inservice. Question 2.03a was included in the survey questionnaire to characterize the participants' perceptions of the effectiveness of this design feature. Language Arts and computer aspects were differentiated from one another for clarification purposes, although in reality, both components were integrated in the Workshop presentation itself. The intent of the question was to gain some sense of the participants' evaluation of the value of "hands on" activities to the effectiveness of the overall Workshop effort.

Analysis:

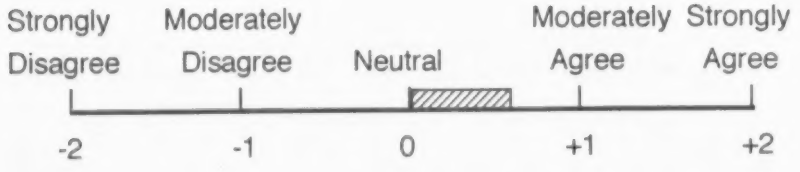
Respondents with moderate prior experience in Language Arts showed the highest level of agreement with the statement. Respondents with minimal or extensive prior experience indicated less agreement with the statement. This pattern fits in well with Vygotsky's paradigm of learning. The Moderate Experience group would correspond to individuals attaining Vygotsky's "zone of proximal development", having sufficient knowledge and resources to expand

their learning. The Minimal Experience group would have too little knowledge to effectively manage additional learning, while those with Extensive Experience would have already mastered the requisite knowledge. Further learning effort would be either frustrating or redundant for these groups.

Table 26: Individual Response: Characterization Of The Benefit Of "Hands On" Language Arts Activities To The Effectiveness Of The Workshop

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	1	3%
Moderately Disagree	5	15%
Neutral Feelings	6	19%
Moderately Agree	14	44%
Strongly Agree	6	19%
Total	**32**	**100%**

Figure 16: Group Response: (+0.59)



The response data for this question was further examined to investigate the influence of prior Language Arts experience, as well as teaching position, towards the perception of the value of "hands on" type activities as presented in the Workshop.

Table 27: Characterization of the Value of "Hands On" Language Arts Activities According to Prior Language Arts Experience

DEGREE OF L.A. EXPERIENCE	CHARACTERIZATION
Minimal Experience	+0.125 (Near Neutral Response)
Moderate Experience	+1.1 (Moderate Agreement)
Extensive Experience	+0.4 (Reserved Agreement)

Table 28: Characterization Of The Value Of "Hands On" Language Arts Activities According To Teaching Assignment (Position)

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	+0.66 (Reserved Agreement)
Gr. 7 - 9 Teachers	+1.0 (Moderate Agreement)

Analysis:

By the nature of their teaching assignment, where Elementary teachers are responsible for teaching most subjects, nearly all Gr. 4 - 6 teachers are involved in teaching Language Arts. (From the study population of Elementary teachers, 13 of the 22 Gr. 4 - 6 teachers - 59%- characterized their prior Language Arts experience as "Extensive.")

In contrast, Junior-High teachers are more often subject specialized, with only some teachers having Language Arts teaching assignments. In the case of the Junior-High teacher participants in this study however, 3 of the 5 teachers - 60% - characterized their prior Language Arts experience as "Extensive", virtually the same as the Gr. 4 - 6 teachers.

How then to explain the difference in response to the question for the two groups? Statistical variation is of course a possibility, as only 5 Junior-High teachers were surveyed compared to 22 Gr. 4 -6 teachers. Another explanation may be associated with the Junior-High curriculum in the province of Alberta at the time. The Junior-High curriculum included a special initiative in process-writing which had been introduced a short time prior to the Workshop. In

comparison, the Elementary curriculum at the time lacked a comparable exposure to process-writing. Junior-High teachers therefore might have responded more positively to the "hands on" Language Arts features of the Workshop as an affirmation of what they had already been exposed to, and to some extent, were already familiar with. Gr. 4 -6 teachers may have had less exposure to process writing at the time, and were therefore more hesitant to accept the concept, "hands on" activities notwithstanding.

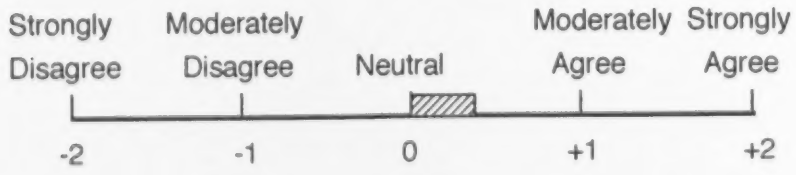
Question 2.03b: "The 'hands on' approach employed during the Workshop really raised my confidence level in applying the computer techniques demonstrated [in the Workshop] to my teaching."

As a counterpart to Question 2.03a, this question was included to gauge the perceived effectiveness of the "hands on" computer techniques demonstrated in the Workshop.

Table 29: Characterization Of Agreement As To The Perceived Value of "Hands On" Computer Activities To The Effectiveness Of The Workshop

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	2	6%
Moderately Disagree	5	16%
Neutral Feelings	8	25%
Moderately Agree	13	41%
Strongly Agree	4	12%
Total	**34**	**100%**

Figure 17: Group Response: (+0.38)



Analysis:

From the response data, the study population appeared to value the "hands on" Language Arts activities of the Workshop slightly more than the computer "hands on" activities - assigning +0.59 characterization to the former and +0.38 to the latter.

Table 30: Characterization Of The Value Of Computer "Hands On" Type Activities To The Perceived Overall Effectiveness Of The Workshop - According To Position

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	+0.29 (Tending Towards Neutral)
Gr. 7 - 9 Teachers	+0.57 (Moderate Agreement)
Administrators	+0.25 (Tending Towards Neutral)

The Gr. 7 - 9 teachers showed the greatest agreement with the statement, while the Gr. 4 -6 teachers and the administrators shared a comparable level of lesser agreement. As in question 2.03a, the response for this response distribution may be attributable to a greater familiarity with and enthusiasm for process-writing by Junior-High teachers, as they had already been exposed to a major process-writing initiative as included in the Junior-High curriculum. In this context then, word processing might be viewed by the Junior-High teachers as a more efficient means to conduct process writing activities. Consequently, the "hands on" computer activities demonstrated in the Workshop might be seen by Junior-High teachers as an effective means of attaining a higher level of word processing skill.

Table 31: Characterization Of The Value of Computer "Hands On" Type Activities To The Overall Effectiveness Of The Workshop According To Prior Word Processing Experience

PRIOR W.P. EXPER.	RESPONSE CHARACTERIZATION
No Experience	0 (Neutral Feelings)
Minimal Experience	+0.66 (Reserved Agreement)
Moderate Experience	+0.53 (Reserved Agreement)
Extensive Experience	+0.63 (Reserved Agreement)

A possible theory for explaining this response distribution is once again closely allied to the Vygotstky model referred to in Question 2.03a. In this instance, the "No Experience" [With Word Processing] group would lie below the boundary of the zone of proximal development in terms of their experience base. All of the word processing techniques would be new to them, and they would be struggling to gain an understanding of the basic operating concepts. Applying those concepts to facilitate Language Arts learning would be even more challenging, involving another level of difficulty. In effect then, having no prior experience with word processing, the "No Experience" group would have little basis to judge the effectiveness of the "hands on" approach, perhaps prompting a cautious "Neutral" characterization.

The Minimal Experience group would be positioned at the lower range of the proximal zone of development. Prompts and procedural algorithms provided by a "hands on" approach would probably be accepted as a real help in assisting their learning. As this group expressed the highest positive affirmation on this question, perhaps it might confirm the operation of Vygotsky's learning model in these circumstances.

The Moderate Experience group, having a good basis for understanding already, would be positioned at the upper boundary of the zone of proximal development. They might gain some benefit from the "hands on" approach, but this would be less than that of the Minimal Experience group. This opinion was reflected in the characterization of their response.

The Extensive Experience group response does not fit the pattern of response for this question, and this may indicate that another mechanism is operating. Having surpassed the zone of proximal development due to their extensive experience base, their response might be less of a reflection of personal utility than one of affirmation. Being confirmed computers users, this group of individuals might be taking the opportunity in their responses to the question to affirm their own practices.

Question 2.04: "Through the Workshop, I gained more confidence in my ability to share my knowledge with my colleagues."

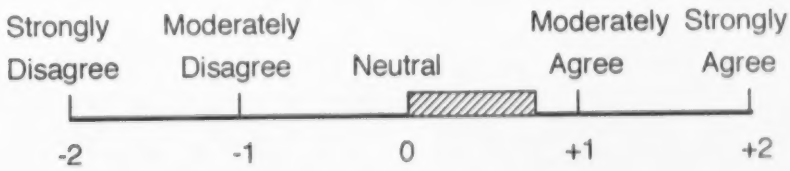
This question was included in the survey questionnaire to gain some sense of the perceived effectiveness of the collaborative / interactive inservice techniques utilized in the Workshop towards raising personal confidence levels. The degree to which an educational innovation is propagated is dependent on, among other factors, the willingness of the individual to transmit the knowledge and / or techniques involved. Willingness to share knowledge or expertise is often a function of personal confidence. If an individual is not comfortable in their understanding of the innovation, s/he will be less likely to transmit the

innovation to others. Indirectly then, the level to which personal confidence (in sharing the innovation) is raised through participation in the inservice is an indicator of the effectiveness of the techniques employed.

Table 32: Individual Response: Characterization of Agreement As To The Degree The Workshop Raised Personal Confidence levels

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	0	0%
Moderately Disagree	3	9%
Neutral Feelings	9	26%
Moderately Agree	16	47%
Strongly Agree	6	18%
Total	**34**	**100%**

Figure 18: Group Response: (+0.73)



The response data for this question was also differentiated according to the position of the respondents (i.e. Gr. 4 -6 Teachers, Gr. 7 - 9 Teachers, etc.), as shown in Table 33.

Table 33: Comparison According To Position

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	+0.59 (Reserved Agreement)
Gr. 7 - 9 Teachers	+1.14 (Moderate Agreement)
Administrators	+0.50 (Reserved Agreement)

Analysis:

For the study population as a whole, agreement with the stated question was characterized as +0.73, placing the level of agreement as somewhat below that of "Moderate Agreement." When the responses were broken down according to teaching position however, the Junior-High teachers showed almost twice the level of agreement with the statement than did the Gr. 4 - 6 teachers or the administrators. This response profile resembles that found for Question 2.03b, indicating that similar influences were operational. It would follow that if the Junior-High teachers felt that the teaching strategies demonstrated in the Workshop were personally relevant, and the response to the "hands on" approach used in the Workshop was positive, then the Junior-High teachers would also feel that they had gained a higher level of confidence from the Workshop that had their Elementary and administrator colleagues.

Question 2.05: "I found working with a partner during the Workshop to be very helpful for my own learning about computer applications to the writing process."

This question was included in the survey questionnaire to gauge the perceived value of collaboration in an inservice effort in a more direct manner. One type of collaboration involves working with one or two partners. Partnership learning, as used in the Workshop, was the focus of this question.

It must be pointed out however that the response to this question might be predicated on the amount of learning that had taken place for the individual polled. Someone who attended the Workshop with a high degree of computer / Language Arts expertise might not actually learn much from their Workshop exposure. Their response to this particular question, if neutral or negative, might indicate that they didn't find working with a partner useful, as they had in fact already mastered the knowledge or techniques presented in the Workshop. If the experienced user actually resented having to work with a partner, negative response might then be even accentuated.

Analysis:

As can be seen from Table 34, prior Language Arts and word processing experience did indeed seem to influence the respondents' valuation of collaborative learning as utilized in the Workshop. Those with both extensive Language Arts and word processing experience valued partnership learning the least for this Workshop.

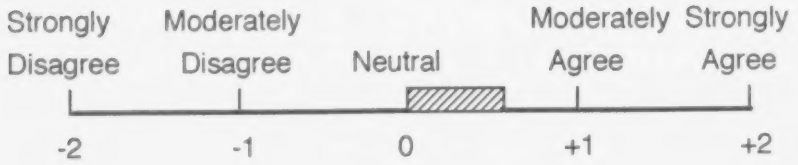
When the data for this question was examined according to teaching position, the Junior-High teachers valued partnership learning the most, while Gr. 4 -6 teachers showed less agreement. Interestingly enough, the administrators in the study population held a negative opinion of partnership learning, characterizing their response as "Moderate Disagreement" with the stated question.

The response profile for this question might be explained in terms of familiarity with collaboration. As subject specialists, Junior-High teachers would be used to consulting with similar-subject colleagues, and this experience would translate well to a collaborative learning situation as typified by Workshop activities. Gr. 4 -6 teachers, for the most part managers of self-contained classrooms, might reasonably be expected to be less familiar with collaborative learning, and therefore value it less in a new situation. Administrators, due to the supervisory and managerial nature of their positions, might also be expected to have less experience with collaborative learning situations, being more comfortable with a didactic learning style. The response to Question 2.06 might confirm or invalidate this possible explanation.

Table 34: Individual Response: Characterization Of The Value Of Collaboration Towards The Effectiveness Of The Inservice

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	0	0%
Moderately Disagree	6	18%
Neutral Feelings	7	21%
Moderately Agree	15	45%
Strongly Agree	5	16%
Total	**33**	**100%**

Figure 19: Group Response: (+0.57)



The distribution of the response data for this question according to teaching position (i.e. Gr. 4 - 6 teachers, Gr. 7 - 9 teachers, etc.) is shown in Table 35:

Table 35: Comparison According To Teaching Position

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	+0.61 (Reserved Agreement)
Gr. 7 - 9 Teachers	+0.81 (Moderate Agreement)
Administrators	-1.0 (Moderate Disagreement)

The data was also reviewed to investigate whether prior experience in Language Arts and / or Word Processing influenced the participants' perceptions of the value of collaborative learning. Responses were compiled for three sub-groups as well as the whole study population. This is shown in Table 36.

Table 36: Comparison According To Subgroup

PARTICIPANT SUBGROUP	RESPONSE CHARACTERIZATION
Whole Study Population	+0.57 (Reserved Agreement)
Extensive L.A. Experience	+0.6 (Reserved Agreement)
Extensive W.P. Experience	+0.44 (Reserved Agreement)
Extensive L.A. & W.P. Exp.	+0.33 (Some Agreement)

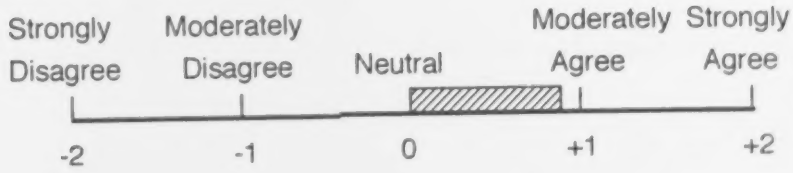
Question 2.06: "I found the group sharing sessions to be informative and worthwhile for the expansion of my own knowledge."

Collaborative learning can also be facilitated through group sharing sessions. To evaluate this aspect of the inservice design, and to confirm the data collected in Question 2.05, this question was included in the survey questionnaire. Response data for this question is shown in Table 37.

Table 37: Individual Response: Characterization of Agreement With the Perceived Value of Group Sharing Sessions To The Effectiveness Of The Inservice

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	0	0%
Moderately Disagree	1	3%
Neutral Feelings	8	24%
Moderately Agree	18	55%
Strongly Agree	6	18%
Total	**33**	**100%**

Figure 20: Group Response: (+0.87)



To test whether a participant's prior knowledge of word processing or Language Arts affected their response to the question of the value of collaborative learning (group sharing), responses from individuals having extensive knowledge in these respective areas were separated out from the pool of data and compared, as shown in Table 38.

Table 38: Comparison According To Subgroup

PARTICIPANT SUBGROUP	RESPONSE CHARACTERIZATION
Whole Study Population	+0.87 (Near Moderate Agreement)
Extensive L.A. Experience	+1.0 (Moderate Agreement)
Extensive W.P. Experience	+0.88 (Near Moderate Agreement)
Extensive L.A. & W.P. Exp.	+1.16 (Moderate Agreement)

Analysis:

From this data, it would appear that having extensive knowledge or experience with Elementary Language Arts or word processing (or both) did not negatively influence a participant's evaluation of the worth of collaborative learning, at least in the form of group sharing sessions. The opposite appears to be the case. Participants having extensive word processing experience responded to the question in almost exactly the same way as the study population as a whole, a +0.87 characterization for the former group vs. +0.88 for the latter group. Participants having extensive Language Arts experience responded even more positively to the question than did the study population as a whole. Those participants having both extensive Language Arts and word processing experience responded the most positively of all, perhaps an indication of the affirmation effect previously referred to in conjunction with the analysis of other questions. There did not appear to be any major difference in the participants' responses according to their teaching position - a consensus of opinion is quite apparent with regards to this particular aspect of the inservice. All participants felt that the group sharing sessions were a positive feature.

When considering various forms of collaborative learning, the study participants were more positive towards the value of group sharing than they were of partnership learning. This may be a function of the different nature of the two collaborative experiences. Partnership learning as used in the Workshop typically involved working one-to-one or a group of three on a practical application - developing writing technique, familiarization with word processing procedures, etc. The nature of the group sharing sessions was somewhat different however, focussing more on philosophic and pedagogic concerns. In the former situation, differences in participant experience level would tend to create a negative affect for the more experienced partner, as s / he would be predominantly involved in assisting the lesser experienced partner. The latter situation would be more positive for the experienced participants, as they could apply their prior knowledge and experience to help resolve group problems or uncertainties.

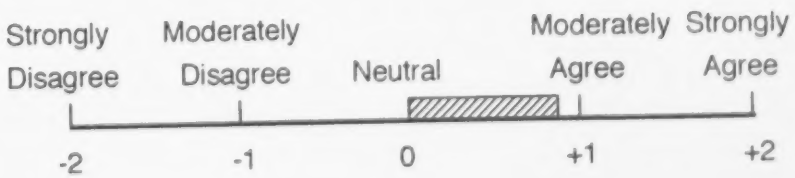
Question 2.07: "I found the Workshop format to be an effective way to develop in teachers new computer applications for the Writing Process, and Language Arts in general."

This question was included in the survey questionnaire to gain some sense of the participants' general response to the Workshop format - that is, how effective they felt all of the design elements were when combined together into a "package." This evaluation also reflected on what advantages this approach might lend to other inservice efforts.

Table 39: Individual Response: Characterization Of Agreement With The Value Of The Workshop Format Towards The Perceived Effectiveness Of The Inservice

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	0	0%
Moderately Disagree	2	6%
Neutral Feelings	7	21%
Moderately Agree	17	50%
Strongly Agree	8	23%
Total	**34**	**100%**

Figure 21: Group Response: (+0.91)



Analysis:

Response to this question was the most positive encountered up to this point in the survey questionnaire. The data for this question was examined from two main perspectives: a) The Teaching Position Of The Participant (ie. Gr. 4 - 6 teacher, etc.), and b) The Prior Knowledge / Experience Of Language Arts and / or word processing that the participant brought to the Workshop. These factors were examined to determine if they significantly influenced the participants' perceptions of the effectiveness of the Workshop format.

Table 40: Characterization Of The Effectiveness Of The Workshop Format According To Prior Language Arts And Word Processing Experience

AREA OF EXPERTISE	EXP. LEVEL	CHARACTERIZATION	
Language Arts	Minimal	+0.66	(Reserved Agreement)
	Extensive	+1.0	(Moderate Agreement)
Word Processing	Minimal	+0.44	(Reserved Agreement)
	Extensive	+1.1	(Moderate Agreement)
L.A. & W.P. Exp.	Extensive	+1.0	(Moderate Agreement)

Characterization For Whole Study Population = +0.91

Response to this question appeared to be influenced by the degree of prior Language Arts and word processing experience. Those participants with minimal Language Arts experience returned a characterization much lower than that for the whole group. In contrast, participants with extensive Language Arts experience provided a characterization that was higher than that of the whole group.

Similarly, participants with minimal word processing experience responded with a characterization one half that of the study population as a whole. Participants with extensive word processing experience returned a characterization again higher than that of the whole study population. The difference between the "Extensive" and "Minimal" experience level characterizations was higher for the word processing sub-group than it was for the Language Arts sub-group, indicating that prior word processing experience was more influential ant in evaluating the format of the inservice. Those with both extensive Language Arts and extensive word processing experience responded with a higher characterization than that of the whole group. Once again, the affirmation mechanism for those with extensive prior experience

appears to be evident in the response to this question.

In addition, the response pattern for the different position sub-groups (ie. Gr. 4 - 6 teachers, administrators, etc.) as demonstrated in the responses for previous questions was also repeated for this one. Gr. 7-9 teachers gave the most positive characterization, followed by the Gr. 4-6 teachers, with the administrators and consultants providing the lowest characterization of agreement. Table 41 illustrates the distribution of responses.

Table 41: Characterization Of The Value Of The Workshop Format To The Perceived Effectiveness Of The Inservice (According To Position)

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	+0.86 (Less Than Moderate Agreement)
Gr. 7 - 9 Teachers	+1.14 (Moderate Agreement)
Administrators	+0.75 (Less Than Moderate Agreement)

Survey Questions 2.00 through 2.07 attempted to characterize the participants' response to the Workshop in the form of which it was presented. The subsequent group of questions - 2.08 to 2.16, attempted to survey and characterize the participants' evaluative response to possible changes in the Workshop format. The possible changes surveyed were:

1. Extending the length of the Workshop.

2. Staggering the presentation of the Workshop over a period of several months, allowing for classroom application in the intervening time.

3. Including a follow-up session for the Workshop, some months after the initial presentation.

4. Providing more inservice trainers / leaders.

5. Using another word processing software package instead of AppleWorks.

6. Organizing the Workshop on the basis of smaller groups.

7. Increasing the number of lecture sessions in the inservice.

8. Providing separate inservices for elementary and junior-high audiences.

9. Establishing an on-going formal support group for the Workshop, facilitating on-going consultation.

Detailed examination of these inservice design aspects follows in the next section.

Question 2.08: "I would have found the Workshop more useful if it had been of a longer duration."

As presented, the Workshop was conducted over a period of two to three days. This particular question was surveyed to characterize the participants' opinion of the duration of the inservice, to help determine if they thought the length of the inservice was insufficient, adequate, or excessive. This perception could influence the overall affect the participant might form towards the inservice effort, and therefore indirectly impinge on the potential for the innovation to be adopted. For example, if the majority of the participants felt that the inservice was too long, they might be negatively influenced to adopt the innovations presented. On the other hand, if the majority of the participants felt that the inservice was too short, they may feel frustration in not having gained sufficent expertise and confidence to begin the innovation process.

One other element must be considered when interpreting this aspect of inservice length - the nature of teaching practice in elementary schools. Unlike industrial workers, teachers (and administrators to a lesser degree) must prepare extensive plans for their fill-in counterparts to continue the functioning of their classroom programs (or school) in their absence. The longer the absence - as in this case for attending an inservice - the greater the amount of preplanning (and subsequent follow-up) is required. This acts as a disincentive for teachers to attend longer inservices as was the case with the Workshop. In addition, another disincentive for participation was the travelling required on the part of rural-based teachers, further adding to the time required to be away from regular teaching duties.

Response to this particular question then, may partially reflect concerns about planning and follow-up workload, in addition to concerns about the inservice itself.

Analysis:

The study population as a whole characterized their agreement as +0.29, slightly above that of Neutral Feelings, meaning that they felt that the length of the inservice was adequate. Alternately, this could also mean that they did not wish to invest the longer classroom planning / follow-up efforts demanded by a longer absence. In either case, the participants felt that a longer inservice probably would have been counterproductive.

When the data was broken down according to position and experience levels however, a somewhat different picture emerged. Prior Language Arts experience did not appear to influence the participants' response to this question significantly. The difference between the highest and lowest characterizations was only 0.11, with the "Minimal / No Experience" group exactly matching the response of the "Moderate" experience group.

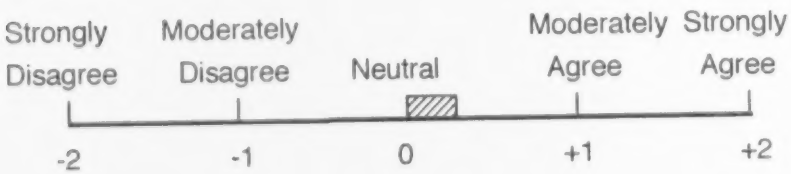
Prior word processing experience appeared to be more influential. Participants with minimal or no prior word processing experience indicated greatest agreement with the option of extending the length of the inservice. Participants with extensive word processing experience also saw benefit in extending the inservice, although to a lesser degree. Participants with moderate word processing experience responded to the question with neutral feelings, indicating that they felt the inservice length was adequate. Response characterizations for the "Minimal" and "Moderate" groups were predictable and understandable. Those with minimal prior word processing experience would welcome the opportunity to learn more, while those with moderate prior experience perhaps felt that they had learned as much as they were capable of absorbing at the time.

The response of those participants with extensive prior word processing experience did not follow the expected trend. Rather than avoiding the prospect of extending the inservice, as one might expect, they generally indicated a preference to do so. How to explain this response? A number of factors, acting alone or in combination may offer an explanation. One might be the "affirmation" phenomena referred to in previous sections, whereby those with extensive expertise might welcome the opportunity to demonstrate or share their knowledge. Another factor might be that those individuals with extensive expertise or experience do not often have the opportunity to meet and interact with others of their ability level. The Workshop provided such an opportunity, facilitating the sharing and trading of knowledge not just confined to the writing process / word processing material covered in the Workshop itself, but also covering a broad range of techniques and information related to computers. From this perspective then, the Workshop (or any similar inservice) would be regarded more as a means to an end - "networking" - than an end in and of itself.

Table 42: Individual Response: Characterization Of Agreement With The Value Of Extending The Length Of The Workshop

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	1	3%
Moderately Disagree	7	21%
Neutral Feelings	12	35%
Moderately Agree	9	27%
Strongly Agree	5	14%
Total	**34**	**100%**

Figure 22: Group Response: Characterization Of Agreement With The Value Of Extending The Length Of The Workshop (+0.29)



The data was also reviewed according to position and to prior Language Arts and word processing experience. Position data was correlated to investigate whether the different sub-groups of the study population (i.e. Gr. 4-6 teachers, Gr. 7-9 teachers, etc.) evaluated this aspect of the inservice differently. Prior experience data was correlated to determine whether experience influenced perception of the optimal length of the inservice.

Table 43: Characterization Of Agreement According To Position

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	+0.09 (Near Neutral Feelings)
Gr. 7 - 9 Teachers	+0.86 (Near Moderate Agreement)
Administrators	+0.25 (Slightly Greater Than Neutral)

Table 44: Characterization Of Agreement According To Prior Experience With Language Arts and Word Processing

AREA OF EXPERTISE	EXP. LEVEL	CHARACTERIZATION
Language Arts	Minimal / None	+0.55 (Reserved Agreement)
	Moderate	+0.55 (Reserved Agreement)
	Extensive	+0.44 (Reserved Agreement)
Word Processing	Minimal / None	+0.66 (Reserved Agreement)
	Moderate	0 (Neutral Feelings)
	Extensive	+0.44 (Reserved Agreement)

Question 2.09: "I would have found the Workshop more useful if the training sessions had been staggered over a period of months, allowing for classroom application in the intervening time.

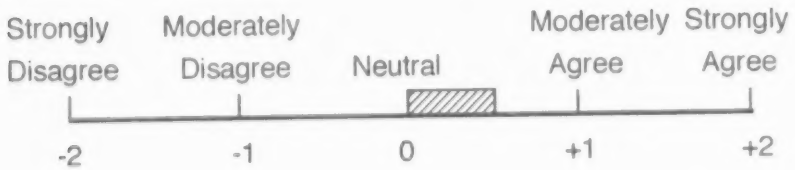
The Workshop was presented over two to three consecutive days. This question was included in the survey to gauge response to the concept of splitting the inservice into a series of mini-sessions spread over a period of months. The intent of this design option would be to permit a better focus for each mini-session, and to allow for application of the techniques / strategies learned in the inservice, in a classroom setting.

In addition, as with Question 2.08, it must be recognized that a hidden commitment is attached to a positive response for this question. Attending a series of small inservice sessions would probably involve a greater classroom program planning / follow-up effort on the part of the participating teachers and administrators than attendance of one single inservice session. In this case, although the total number of inservice hours might be the same for both options, the mini-session approach would require a greater commitment of time and effort. The travel considerations as well as the extra costs involved with multiple sessions would even further skew the time / effort equation.

Table 45: Individual Response: Characterization Of Agreement For Value Of Staggered Inservice Sessions

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	1	3%
Moderately Disagree	2	6%
Neutral Feelings	12	36%
Moderately Agree	15	45%
Strongly Agree	3	10%
Total	**33**	**100%**

Figure 23: Group Response: Characterization Of Agreement For Value Of Staggered Inservice Sessions (+0.51)



Analysis:

For the whole study population, reaction towards the concept of multi-session inservice could be characterized as "Reserved Agreement." As with Question 2.08, the response data was further broken down according to position (i.e. Gr. 4-6 teachers, Gr. 7-9 teachers etc.) and by prior word processing and Language Arts experience.

Table 46: Characterization Of Agreement According To Position

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	+0.41 (Reserved Agreement)
Gr. 7 - 9 Teachers	+0.57 (Reserved Agreement)
Administrators	0 (Neutral Feelings)

Table 47: Characterization Of Agreement According To Prior Language Arts and Word Processing Experience

AREA OF EXPERTISE	EXP. LEVEL	CHARACTERIZATION
Language Arts	Minimal / None	+0.33 (Reserved Agreement)
	Moderate	+0.66 (Reserved Agreement)
	Extensive	+0.44 (Reserved Agreement)
Word Processing	Minimal / None	+0.55 (Reserved Agreement)
	Moderate	+0.38 (Reserved Agreement)
	Extensive	+0.55 (Reserved Agreement)

Analysis:

The study population as a whole indicated a characterization comparable to "Reserved Agreement" as to the potential usefulness of the mini-session inservice format. On the basis of position however, the Gr. 7-9 teachers were the most positive in their response (+0.57), while the Gr. 4-6 teachers were somewhat less positive (+0.41). The Administrator group were evenly split in their opinion, positive and negative, with a net result of a neutral characterization. (0).

The difference between the Gr. 4-6 and 7-9 group characterizations may be partly due to the classroom program planning / follow-up "deterrent" factor previously discussed. Another factor may be the greater experience of the Gr. 4-6 Teachers with accommodating curriculum change. As Elementary teachers are generally responsible for teaching more subjects than Junior-High teachers, they are involved with a greater number and more frequent curriculum-change inservice efforts. This may create a bias on their part against mini-session inservices.

As the Administrator / Consultant group were evenly split in their opinion, no clear pattern of response was evident. Due to the small sample size (4 respondents) and the split opinions expressed, the resultant characterization may be more attributable to differences in personal opinion than to any specific trend related to position.

When the response data for this question was examined according to prior Language Arts and word processing experience, and the results plotted in graph format, each data set appeared to be the mirror image of the other. No clear explanation, nor possible hypothesis for this pattern has yet been derived.

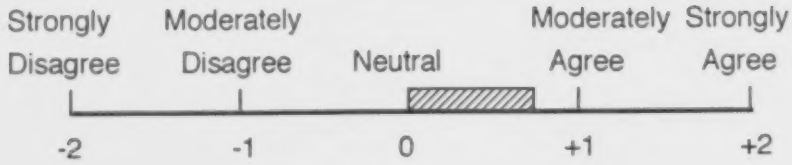
Question 2.10: "I would have found the Workshop more useful it it had been succeeded by a follow-up session some months after classroom application."

Each Workshop session was a self-contained effort, with no formal follow-up conducted. Question 2.10 was included in the survey questionnaire to canvas opinion as to the potential benefit of a formal follow-up effort. As with Questions 2.08 and 2.09, it must be recognized that this question includes a hidden aspect relating to implied additional commitment. A positive response would signify that the respondent would be willing to commit additional time and resources beyond that expended for the original inservice session. Alternately, a negative response to the question would not necessarily mean that the participant did not wish to expend the additional effort involved. He or she just might not regard the concept of a follow-up as a good idea.

Table 48: Individual Response:Characterization Of Agreement With Value Of A Follow-Up Session To The Effectiveness Of An Inservice

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	1	3%
Moderately Disagree	1	3%
Neutral Feelings	7	21%
Moderately Agree	21	62%
Strongly Agree	4	11%
Total	**34**	**100%**

Figure 24: Group Response: (+0.76)



Analysis:

The overall characterization for the study population for this question was verging towards moderate agreement (+0.76), meaning that the respondents generally thought that a follow-up session would have been a beneficial feature for the Workshop.

When categorized according to position (ie. Gr. 4-6 teachers, administrators, etc.), the responses showed that the Gr. 7-9 teachers were more than twice as positive in this response towards the concept of a follow-up session as were the Gr. 4-6 teachers and the administrator group in the study population. This disparity may be due to either the "deterrent" factors previously discussed in Questions 2.08 and 2.09, or to a more positive past experience on the part of the Gr. 7-9 teachers, or a combination of both.

When characterization of agreement for this question was correlated with prior Language Arts and word processing experience, the now familiar (for this study population) "crisscross" graph pattern emerged. For the prior Language Arts experience graph, the degree of agreement rose with increased experience, reaching its highest point at the "Moderate" experience level, then declining once more at the "Extensive" experience level. This trend was inversely represented when position was correlated with prior Language Arts experience.

For the prior word processing experience graph, the characterization of agreement with the question began at a high level when the respondents had "Minimal" or "No Experience", declined as the w.p. experience level rose to the "Moderate" point, then began rising again as w.p. experience rose to "Extensive." Once again, this trend line was inversely represented when position was correlated with prior word processing experience.

Two possible explanations may be posited for this phenomena. On the one hand, the disproportionate position representation (twice as many Elementary teachers as Junior / High teachers or administrators) may be creating a statistical "artifact" unique to this database. On the other hand, the position /

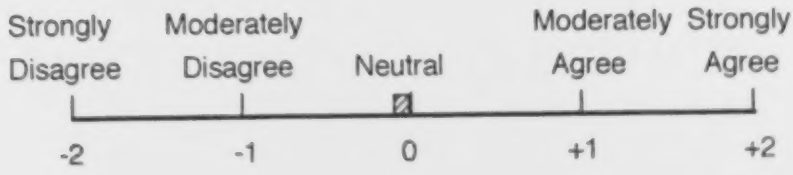
prior experience relationship may be a real, as opposed to an apparent, determinant. In both of these cases, a larger study population base, and more sophisticated analysis methods would be required to confirm or eliminate these possible explanations.

Question 2.11: "I would have found the Workshop more effective if more trainers / leaders would have been available."

Table 49: Characterization Of Agreement With Potential Benefit Of Having More Trainers / Leaders At The Workshop (Individual Response)

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	1	3%
Moderately Disagree	6	18%
Neutral Feelings	22	65%
Moderately Agree	5	14%
Strongly Agree	0	0%
Total	**34**	**100%**

Figure 25: Group Response: Characterization Of Agreement With Potential Benefit Of Having More Trainers / Leaders At The Workshop (-0.08)



Analysis:

On a whole study population basis, the respondents characterized their response to the question of the potential benefit of having more trainers /

leaders available during the Workshop as near Neutral (-0.08). This means that they felt that the number of trainers / leaders was sufficient, and that providing more would not have been useful.

When the data was examined according to prior Language Arts and word processing experience, and by position, some differences in characterization did appear, but these did not appear to be significantly large enough to represent any real difference in overall opinion for this issue.

The level of prior word processing experience appeared to influence agreement with the question more than did prior Language Arts experience. As in previous questions, the characteristic "crisscross" pattern was once again evident in the graph plot, although this time it was skewed more towards the "Moderate" experience level range than had been shown in the plots for previous questions. As might be expected however, the "Minimal" experience group was the most positive towards the idea of having additional trainers, while the "Moderate" and "Extensive" experience groups tended towards neutral or slightly negative feelings. Even so, the "Minimal" group's response was not very strong, indicating that they were fairly satisfied with the amount of training support provided. The Workshop provided a learner-to-trainer ratio of about 7 to 1, and this level of support was felt to be sufficient by the majority of the participants. The response data from this survey question suggests that such a ratio of support might be generalizable as optimal to similar-sized and designed inservice efforts, at least from the participants' point of view.

Table 50: Characterization According To Position:

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	-0.18 (Slight Disagreement)
Gr. 7 - 9 Teachers	-0.14 (Slight Disagreement)
Administrators	-0.25 (Slight Disagreement)

Table 51: Characterization According To Prior Experience With Language Arts and Word Processing

AREA OF EXPERTISE	EXP. LEVEL	CHARACTERIZATION
Language Arts	Minimal / None	+0.22 (Slight Agreement)
	Moderate	-0.22 (Slight Disagreement)
	Extensive	-0.19 (Slight Disagreement)
Word Processing	Minimal / None	+0.33 (Reserved Agreement)
	Moderate	-0.63 (Reserved Disagreement)
	Extensive	0 (Neutral)
L.A. and W.P.	Extensive	-0.16 (Slight Disagreement)

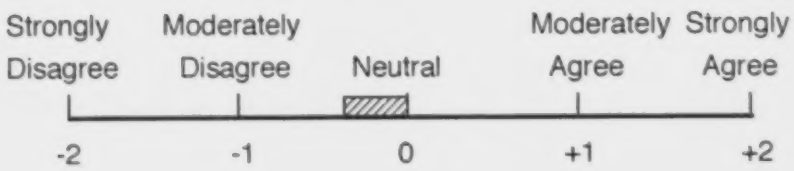
Question 2.12: "I would have found the Workshop more effective if another software package other than AppleWorks had been used."

This question was included in the survey to determine the positive or negative effect(s) of basing the Workshop on one particular software package - in this case, AppleWorks. The two main educational computers used in Alberta schools at the time were Apples and IBM PC's; each having software incompatible with one another. By choosing an Apple-based software package, the Workshop designers faced the prospect of alienating IBM-based teachers and administrators. The question was posed to find out whether the prospect of alienating IBM users was in fact realized in the Workshop, and to determine whether this aspect might make a significant impact on the receptivity of the participants towards the featured innovations.

Table 52: Individual Response:Characterization Of Agreement With The Potential Benefit Of Utilizing Another Software Package For The Inservice

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	7	21%
Moderately Disagree	9	27%
Neutral Feelings	9	27%
Moderately Agree	6	18%
Strongly Agree	2	7%
Total	**33**	**100%**

Figure 26: Group Response: (-0.39)



Analysis:

The group response characterization for the question indicated that the surveyed participants disagreed with the question as posed. In fact, the respondents felt that the choice of AppleWorks was the foundation software package for the Workshop was the right one, and for the most part, they would not have wanted another one. At the least, this positive affect towards AppleWorks on the part of the group would mean that the choice of software was not an inhibitor to the promotion of the innovation, and may have even benefited the adoption process.

Table 53: Characterization Of Agreement According To Position

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	-0.38 (Slight Disagreement)
Gr. 7 - 9 Teachers	-0.71 (Moderate Disagreement)
Administrators	0 (Neutral Feelings)

When the response data for this question was categorized according to the position of the respondents (ie. Gr. 4-6 teachers, Gr. 7-9 teachers, etc.), Junior High teachers showed a greater liking for AppleWorks than did the Elementary teachers. This disparity may be partly due to the higher word processing experience level of the Junior-High teachers than the Elementary teachers. Familiarity with AppleWorks itself was not surveyed in the questionnaire. Interestingly, the administrator / consultant group, although of an equal word processing experience level to that of the Junior-High teachers, did not similarly express a preference for AppleWorks. Instead, their feelings were characterized as neutral, indicating that AppleWorks neither served as an inhibitor nor a facilitator towards their Workshop receptivity.

Table 54: Characterization Of Agreement According To Level Of Prior Word Processing Experience

PRIOR W. P. EXP.	CHARACTER. OF GROUP RESPONSE
Minimal / None	-0.13 (Slight Disagreement)
Moderate	-0.06 (Near Neutral Feelings)
Extensive	-1.22 (Moderate Disagreement)

When the response data was sorted according to the participants' prior word processing experience, the "Minimal / None" and "Moderate" experience groups indicated near neutral feelings towards the question. Only those respondents with extensive prior word processing experience expressed moderate disagreement with the question, indicating that they in fact moderately approved of the choice of using AppleWorks for the Workshop.

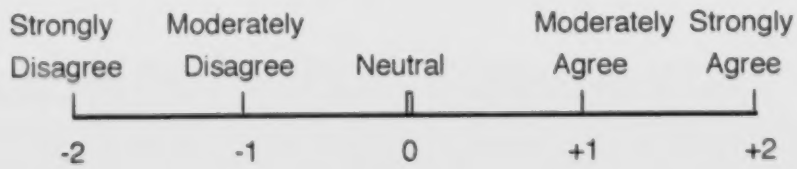
Question 2.13: "I would have found the Workshop more effective if the groups had been smaller."

In the Workshop, participants were grouped for the most part in trios. In contrast, some inservice researchers have promoted the concept of two-person partnerships as the most effective organizational design for inservice collaboration. Question 2.13 was included in the survey to test the participants' feelings towards this grouping, and by negative characterization, to determine if they would have preferred larger groupings than the 3-person design used in the Workshop.

Table 55: Individual Response: Characterization Of Agreement Of The Potential Value Of Having Smaller Groups At The Workshop

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	2	6%
Moderately Disagree	9	26%
Neutral Feelings	14	41%
Moderately Agree	6	18%
Strongly Agree	3	9%
Total	**34**	**100%**

Figure 27: Group Response: (-0.029)



Analysis:

The group response characterization for this question (-0.029) verges on "Neutral Feelings", indicating that the group felt that the 3-person learning arrangement was adequate, and that a smaller 2-person arrangement was not preferred.

Table 56: Characterization Of Agreement According To Position:

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	+0.05 (Near Neutral Feelings)
Gr. 7 - 9 Teachers	-0.14 (Slight Disagreement)
Administrators	-0.25 (Slight Disagreement)

According to position, the Gr. 4-6 teachers most indicated neutral feelings towards the question, followed by the Gr. 7-9 teachers and the administrator / consultant group. The overall difference between the highest and lowest characterizations for this question was very small however, with all of the characterizations verging towards neutral, indicating a close unanimity of opinion.

Table 57: Characterization Of Agreement According To Prior Word Processing And Language Arts Experience

AREA OF EXPERTISE	EXP. LEVEL	CHARACTERIZATION
Language Arts	Minimal / None	0 (Neutral Feelings)
	Moderate	-0.22 (Slight Disagreement)
	Extensive	-0.13 (Slight Disagreement)
Word Processing	Minimal / None	+0.11 (Slight Agreement)
	Moderate	+0.06 (Near Neutral Feelings)
	Extensive	-0.33 (Slight Disagreement)
L.A. and W.P.	Extensive	-0.66 (Reserved Disagreement)

When arranged according to prior word processing and Language Arts experience, the responses showed little effect for varying levels of prior experience in Language Arts. All experience levels for this element showed near Neutral responses to the question. This trend, embedded in the familiar "crisscross" pattern for this study population when graphed, was similarly true for the effects of prior word processing experience.

Extensive experience in both Language Arts and word processing apparently had an additive effect however, for respondents in this category showed the largest magnitude response, verging towards "Reserved Disagreement" with the posed question. One possible explanation for this trend might be that those individuals having extensive experience in both Language Arts and word processing would have mastered the technical aspects of the subjects. They would no longer see themselves benefiting from small group sessions, preferring instead the wider diversity of opinion, and the focus on more philosophic aspects, found in larger group sessions.

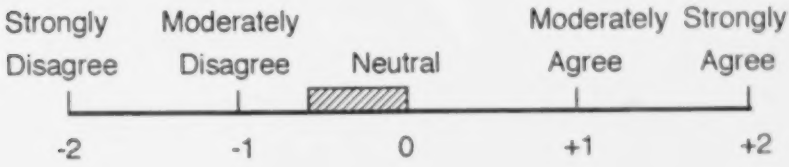
Question 2.14: "I would have found the Workshop more effective if the inservice had contained more lecture sessions."

Most inservice formats attempt to strike a balance between theoretical concepts and practical application. Too much theory without a corresponding opportunity to apply the knowledge presented would be non-productive. Similarly, emphasis is placed on practical applications, without an adequate theoretical foundation being established, then the overall effectiveness of the inservice (innovation effort) may be decreased. This particular question was included in the survey to determine whether, in the opinion of the participants, an effective balance between theory and practice had been established in the Workshop.

Table 58: Individual Response:Characterization Of Agreement With Value Of Adding More Lecture Sessions To The Inservice

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	5	15%
Moderately Disagree	14	41%
Neutral Feelings	12	35%
Moderately Agree	2	6%
Strongly Agree	1	3%
Total	**34**	**100%**

Figure 28: Group Response: Characterization Of Agreement With Value Of Adding More Lecture Sessions To The Inservice (-0.58)



Analysis:

On a group basis, the survey respondents indicated "Reserved Disagreement" with the question, meaning that they disagreed with the potential value of adding more lecture sessions to the inservice, and perhaps partially felt that there may have been too many lecture sessions in the Workshop as it was presented.

Table 59: Characterization Of Agreement According To Position

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	-0.59 (Reserved Disagreement)
Gr. 7 - 9 Teachers	-1.14 (Moderate Disagreement)
Administrators	-0.25 (Slight Disagreement)

When categorized according to position, all of the participants indicated some degree of disagreement with the question. The Gr. 7-9 teachers showed the greatest level of disagreement, the administrator group having the lowest level of disagreement, and the Gr. 4-6 teachers' characterization falling somewhere in between those two groups.

Table 60: Characterization Of Agreement According To Prior Language Arts and Word Processing Experience

AREA OF EXPERTISE	EXP. LEVEL	CHARACTERIZATION
Language Arts	Minimal / None	-0.44 (Reserved Disagreement)
	Moderate	-0.56 (Reserved Disagreement)
	Extensive	-0.69 (Reserved Disagreement)
Word Processing	Minimal / None	-0.33 (Slight Disagreement)
	Moderate	-0.69 (Reserved Disagreement)
	Extensive	-0.67 (Reserved Disagreement)
L.A. and W.P.	Extensive	-0.83 (Moderate Disagreement)

When the response data was categorized according to prior word processing and Language Arts experience, as expected, the level of disagreement with the question rose with an increase in the experience level. Those respondents with the least prior experience showed the least disagreement with the idea of added lecture sessions, while those respondents with the most prior experience most disagreed with the notion of additional lectures.

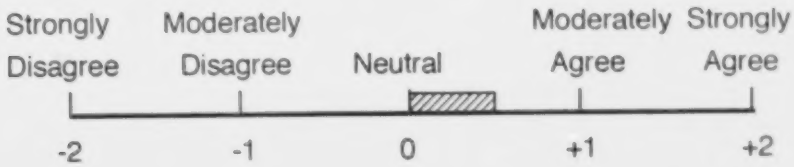
Question 2.15: "I would have found the Workshop more effective if different sessions had been arranged for Elementary and Junior / Senior High teachers."

This survey question was included in order to gauge the effects of narrowing the prospective audience of the inservice. By narrowing the audience, the inservice could be more specifically targeted towards the needs of the participants, thereby making the inservice more relevant. Improved relevancy should increase the chances of the target audience adopting the innovation promoted.

Table 61: Individual Response Characterization Of Agreement Of The Benefit Of Narrowing The Inservice Audience

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	0	0%
Moderately Disagree	9	26%
Neutral Feelings	7	22%
Moderately Agree	9	26%
Strongly Agree	9	26%
Total	**34**	**100%**

Figure 29: Group Response: (+0.52)



Analysis:

On an overall group basis, the respondents showed some agreement with the statement. When the response data was categorized according to position however, a clearer response pattern emerged however.

Table 62: Characterization Of Agreement According To Position:

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	+0.36 (Reserved Agreement)
Gr. 7 - 9 Teachers	+0.86 (Moderate Agreement)
Administrators	+0.75 (Moderate Agreement)

The Gr. 7-9 teachers and the administrator group more strongly felt that narrowing the Workshop audience would have been beneficial to the effectiveness of the inservice than did the Gr. 4-6 teachers. In fact, the strength of their agreement was more than double that of their Elementary colleagues. One reason for this accentuated response might lie in the different natures of Elementary teaching and that of Junior / Senior high school teaching and administration. Elementary teachers, being responsible for teaching a wide diversity of subjects and curricula, might be more accepting of a generalized inservice format. In contrast, Junior / Senior teachers and administrators, being more specialized in their functions, might prefer a more focused and specific inservice approach. All of the groups surveyed however, indicated an overall preference to some degree of separating the Workshop into different sessions for different groups, even though some individuals within those groups did disagree with that position.

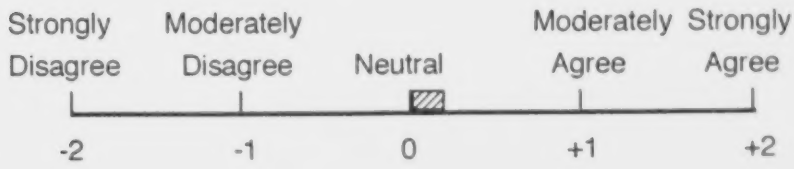
Question 2.16: "I would have better assimilated and applied the teacher strategies / knowledge presented in the Workshop if a formal support group had been available for ongoing consultation."

This question was included in the survey to determine the potential value of an ongoing support group as a design element of an inservice. A criticism of the traditional one-time inservice has been the lack of opportunity for follow-up, clarification, and / or consultation. One method of addressing this deficiency has been the establishment of a follow-up support group whose purpose is to fulfil the needs of the inservice participants.

Table 63: Individual Response: Characterization of Agreement With Potential Value Of A Follow-Up Support Group For The Inservice

CHARACTERIZATION	NO. OF RESP.	PERCENT
Strongly Disagree	2	6%
Moderately Disagree	5	15%
Neutral Feelings	12	35%
Moderately Agree	14	41%
Strongly Agree	1	3%
Total	**34**	**100%**

Figure 30: Group Response: Characterization of Agreement With Potential Value Of A Follow-Up Support Group For The Inservice (+0.20)



Analysis:

On an overall basis, the respondents slightly agreed with the propositional statement advocating the provision of a follow-up support group. The characterization of the group response was more towards neutral feelings than moderate agreement, however. This may be indicative of an unfamiliarity with the form and function of inservice support groups rather than any specific uncertainty pertaining to a Workshop application. This aspect was further investigated through examination of the data with respect to respondent position (ie. Gr. 4-6 teacher, administrator, etc.) and prior Language Arts and word processing experience.

Table 64: Characterization Of Agreement According To Position

PARTICIPANT GROUP	RESPONSE CHARACTERIZATION
Gr. 4 - 6 Teachers	+0.14 (Slight Agreement)
Gr. 7 - 9 Teachers	+0.71 (Moderate Agreement)
Administrators	0 (Neutral Feelings)

When the responses were compared according to position, the Gr. 7-9 teachers most agreed with the stated question, the Gr. 4-6 teachers showed slight agreement, and the administrator group offered a neutral opinion. There are several possible explanations for this divergence in opinion. One aspect has to do with prior experience with support groups, as was alluded to earlier. the Junior-High teachers may have had a more positive prior experience with support groups than did their Elementary counterparts, and therefore would be willing to view another one as beneficial.

Another aspect is that of implied commitment, which also has been mentioned earlier in connection to other responses. The Elementary teachers may have preferred a one-time, unencumbered inservice where no further time or effort commitments would have to be made. Provision for a follow-up support group might imply that the inservice design itself would be more complex, and therefore more demanding for the participants.

Table 65: Characterization Of Agreement According To Prior Language Arts and Word Processing Experience

AREA OF EXPERTISE	EXP. LEVEL	CHARACTERIZATION
Language Arts	Minimal / None	+0.11 (Slight Agreement)
	Moderate	+0.44 (Reserved Agreement)
	Extensive	+0.13 (Slight Agreement)
Word Processing	Minimal / None	0 (Neutral Feelings)
	Moderate	+0.56 (Reserved Agreement)
	Extensive	-0.22 (Slight Disagreement)
L.A. and W.P.	Extensive	-0.17 (Slight Disagreement)

Analysis:

When the response data was categorized and plotted according to prior word processing and Language Arts experience, some trends were evident. Those respondents with little or no prior experience expressed near neutral feelings towards the statement, indicating that they were perhaps adverse towards committing themselves to an opinion either way. This may be attributable to their inexperience itself.

Those respondents with moderate prior experience felt that a follow-up support effort might be beneficial to some degree. In contrast, and as one might expect, those with extensive experience saw little need for a follow-up support group, as they themselves would not benefit from one.

In overall terms then, response to the question of the potential benefit of a follow-up support group depended on two main variables, the teaching situation of the respondent, and the prior experience of the respondent with the knowledge focus of the Workshop - word processing and Language Arts.

Responses For Part 3 of the Survey Questionnaire:
Teaching Applications Of Having Participated In The Workshop

The third part of the survey questionnaire was designed to elicit response concerning the long term effects of having participated in the Workshop, in the nature of subsequent:

1. Changes adopted in personal teaching practice.
2. Difficulties in applying Workshop strategies towards own personal teaching practice.
3. Changes in personal opinion about the suitability / applicability of computers in Language Arts.
4. Changes in personal willingness to implement computer applications.
5. Application of computers in personal classroom Language Arts program, and the inhibitors deterring computer use.

The questions contained in Part 3 of the survey questionnaire are outlined in the following section, along with an explanation of why they were included, and the response data that was collected.

Question 3.00: "I would characterize my application of the knowledge I gained at the Workshop towards my own teaching practice as:

Table 66: Response Categories

RESPONSE CATEGORY	NUMBER OF RESP.	PERCENTAGE
Nil	2	6%
Minimal	8	24%
Moderate	14	42%
Extensive	5	15%
Full Adoption	4	12%
Total	**33**	**100%**

Analysis:

The ultimate purpose of an inservice effort is to promote innovation. While the main goal of the Workshop was to train inservice leaders, it is important that those leaders have a practical familiarity with the innovation being promoted. One measure of that familiarity is the extent that the Workshop participants themselves adopted the innovation and applied it in their own teaching practice.

In this particular effort, nearly one third of the participants either did not apply any of the knowledge gained in the Workshop to their teaching practice, or else made a minimal application. More than one third of the participants indicated that they had made a moderate application of the knowledge they had gained, while slightly less than one third reported extensive application or full adoption of the innovation. On the basis of the study population responses, 71% of the Workshop participants reported significant adoption of the featured innovation - a good success rate.

A hidden factor may also be operating in this situation, making the "real" adoption rate even higher. It should be noted that some of the respondents reported "Nil" or "Minimal" adoption because they did not have an opportunity to actually apply the knowledge they had gained, as they were not involved in Language Arts instruction or were removed from a teaching situation.

The response for this question was further categorized according to the following criteria, in order to determine if they influenced the adoption process:

* Teaching Position (ie. Gr.4-6, Gr. 7-9, Administrator).
* Prior Language Arts Training / Experience.
* Prior Computer Training / Experience.

Table 67: Group Response: Application Of Innovation According To Teaching Position

Elementary Teachers:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Nil	1	4%
Minimal	7	32%
Moderate	8	36%
Extensive	3	14%
Full Adoption	3	14%
Total	**22**	**100%**

Table 67 (Continued):

Junior-High Teachers / Administrators:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Nil	1	9%
Minimal	2	18%
Moderate	5	45%
Extensive	2	18%
Full Adoption	1	9%
Total	**22**	**100%**

Table 68: Group Response: Application Of Innovation According To Previous Language Arts Experience

Minimal Experience:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Nil	3	33%
Minimal	2	22%
Moderate	3	33%
Extensive	1	11%
Full Adoption	0	0%
Total	**9**	**100%**

Moderate Experience:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Nil	0	0%
Minimal	2	22%
Moderate	6	67%
Extensive	1	11%
Full Adoption	0	0%
Total	**9**	**100%**

Table 68 (Continued):

Extensive Experience:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Nil	0	0%
Minimal	4	25%
Moderate	5	31%
Extensive	3	19%
Full Adoption	4	25%
Total	**16**	**100%**

Table 69: Group Response: Application Of Innovation According To Previous Computer Training / Experience

Minimal Experience:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Nil	0	0%
Minimal	5	56%
Moderate	3	33%
Extensive	1	11%
Full Adoption	0	0%
Total	**9**	**100%**

Moderate Experience:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Nil	2	11%
Minimal	3	17%
Moderate	7	39%
Extensive	3	17%
Full Adoption	3	17%
Total	**18**	**100%**

Table 69 (Continued):

Extensive Experience:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Nil	0	0%
Minimal	1	14%
Moderate	4	57%
Extensive	1	14%
Full Adoption	1	14%
Total	**7**	**100%**

Analysis (continued):

When the response data is grouped and compared in the context of supporting the adoption of the Workshop innovation - Moderate to Full adoption, the pattern shown in Table 70 emerges.

Table 70: Application According To Position and Previous Experience

CATEGORY	PERC. OF ADOPT.	PERC. OF ADOPT.	PERC. OF ADOPT.
1. Position	Elementary 64%	Junior-High / Admin. 72%	
2. Previous L.A.	Minimal 44%	Moderate 78%	Extensive 75%
3. Previous Comp.	Minimal 44%	Moderate 73%	Extensive 85%

It appears that Teaching Position did not have any major influence on the adoption of the Workshop innovation, as the reported adoption distribution for the Elementary teachers and the Junior-High / Administrator group was very similar, differing only by 8%, well within experimental error for a sample of this size.

In contrast, both previous Language Arts and previous computer experience

did have an effect on the adoption rate. As the degree of prior Language Arts experience rose from minimal to moderate to extensive, the level of innovation adoption for the Workshop improved, plateauing at a level in the mid-70 per cent range. The trend for the contribution of prior computer experience was even more dramatic, topping out at a mid-80 per cent level. From this data, it appears that prior computer experience was a more important determinant in predicting innovation adoption levels than was prior Language Arts experience.

Question 3.01: "Difficulties in applying Workshop strategies towards my own teaching practice have been mostly due to:

( ) Lack of resources. (ie. insufficient computers, software, restricted access to computers etc.)

( ) Lack of organizational support (ie. scheduling constraints, Principal's non-support, colleagues' non-support)

( ) Insufficient planning / implementation time.

( ) Student grouping factors (ie. large class size, split grades).

( ) Personal doubts as to utility / effectiveness of the approach.

( ) Impracticality of the Workshop content and the teaching strategies presented.

( ) Other:"

This question was posed to elicit inhibitors to the innovation adoption process. The relative impact of the inhibitors would tend to influence the overall adoption process. For example, some inhibitors such as student grouping factors or insufficient planning / implementation time could be ameliorated through other strategies, and therefore might not have a major impact on the adoption process. Other inhibitors, such as lack of computers or software, might have a large impact.

For the group response that follows, some survey items were grouped together to facilitate the reporting process.

Table 71: Group Response: "Difficulties in applying Workshop strategies . . . have been mostly due to:"

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Lack Of Resources /Support	16	47%
Insufficient Planning Time	4	12%
Not Teaching L.A.	5	15%
Other	9	26%
Total	**34**	**100%**

The response data for this question was also examined in order to determine if:

1. Teaching Position affected the type or nature of difficulties that were encountered in attempting to adopt the Workshop innovation. As Elementary and Junior / Senior High teaching situations are somewhat different in approach and character, this researcher wondered whether the teaching situation itself would be an inhibitor to adopting the Workshop innovation.

2. School Location affected innovation adoption efforts. For example, rural school jurisdictions might encounter more difficulty in adopting an innovation than a large urban school jurisdiction due to distance from support centers (ie. Alberta Education, technical support, etc.) as well as funding inequities.

Table 72: Group Response: Difficulties In Adopting The Workshop Innovation According To Teaching Position

Elementary Teachers:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Lack Of Resources	12	60%
Insufficient Planning Time	2	10%
Not Teaching L.A.	1	5%
Other	5	25%
Total	**20**	**100%**

Table 72: (Continued)

Junior-High Teachers / Administrators:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Lack Of Resources	5	50%
Insufficient Planning Time	2	20%
Not Teaching L.A.	1	10%
Other	2	20%
Total	**10**	**100%**

Table 73: Group Response: Difficulties In Adopting The Workshop Innovation According To School Location

Rural:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Lack Of Resources	7	54%
Insufficient Planning Time	1	8%
Not Teaching L.A.	1	8%
Other	4	31%
Total	**13**	**100%**

Rural / Urban Mix:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Lack Of Resources	7	64%
Insufficient Planning Time	1	9%
Not Teaching L.A.	1	9%
Other	2	18%
Total	**11**	**100%**

Table 73: (Continued)

Urban:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Lack Of Resources	2	40%
Insufficient Planning Time	2	40%
Not Teaching L.A.	0	0%
Other	1	20%
Total	**5**	**100%**

Analysis:

In reviewing the data, the most important factor identified by the respondents inhibiting the adoption process was the lack of sufficient resources, both in terms of computer hardware / software, and time, in the form of scheduling for computer access. Computer innovations are somewhat unique in that they require all of the necessary hardware and software to be in place before implementing an instructional program. While traditional educational innovations based upon textbook or print resources can be implemented without sufficient resources for every student, the interactive nature of computer-based learning requires that a certain minimum standard of resources be provided. In the case of the Writing Process innovation featured in the Workshop, no less than one computer for every two students would be necessary. At the time the Workshop was held, many Alberta schools lacked sufficient computer resources to meet the needs of a class of students - a condition which to a great extent still continues to the present day.

One additional point must be considered. The question assumed that the respondents did in fact encounter difficulties in adopting the computer innovations promoted by the Workshop. That was not the case with four respondents, who indicated that they hadn't experienced any significant difficulties whatsoever. By definition, therefore, the responses for these four individuals could not be accommodated in the analysis for this question beyond acknowledging that they had not experienced difficulties.

Question 3.02: "Since my attendance of the Writing Process Workshop, my own personal opinion of the suitability / applicability of computers in Language Arts has:

( ) Declined
( ) Remained about the same.
( ) Increased."

This question was included in the survey questionnaire to gain a characterization of the "persistence" of the ideas and attitudes promoted by the Workshop. The long term impact of many inservice efforts in the past has been minimal, and the question was posed to gauge the influence the Workshop - with its' collaborative "hands-on" focus - had had on its' participants after a few years had passed.

Interpretation of the responses themselves were somewhat problematic, as they often required contextual background information to establish a valid characterization for the participants. For example, while a respondent might provide a "Remained the Same" characterization to the question, it could be interpreted in different ways. The respondent might have indicated so due to the fact that they were unconvinced of the value of the Workshop, and had seen nothing that might change their opinion. Alternately, the respondent could already be a very strong supporter of computer applications in Language Arts and still validly provide a "Remained the Same" characterization. Similar interpretation variables exist for the two other possible responses to this question. While some contextual information was provided by respondents' written comments and through personal interview, not all respondents explained their position in this matter, making definitive analysis imprecise.

Table 74: Group Response: ". . . personal opinion of the suitability / applicability of computers in Language Arts has:"

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Declined	0	0%
Remained The Same	19	56%
Increased	15	44%
Total	**34**	**100%**

Analysis:

The response to this question was nearly evenly split between the "Remained The Same" and "Increased" categories. It is important to note that none of the respondents indicated that their attendance of the Workshop had affected their opinion in a negative way. If by design, inservice efforts are created to promote educational change, the response data for this question supports the position that the Workshop was reasonably successful in fulfilling that goal. Nearly one half of the respondents indicated that they had been positively influenced by their attendance.

The response data was also reorganized according to Teaching Position (i.e.

Gr.4-6 teachers, Gr. 7-9 teachers / administrators), to determine if teaching assignment was a factor in the response provided to this question.

Table 75: Group Response: Changes In Personal Opinion As To the Suitability / Applicability Of Computers According To Teaching Position

Elementary Teachers:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Declined	0	0%
Remained The Same	13	57%
Increased	10	43%
Total	**23**	**100%**

Junior-High Teachers / Administrators:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Declined	0	0%
Remained The Same	5	45%
Increased	6	55%
Total	**11**	**100%**

Analysis (continued):

When the response data for the two major participant groups was compared, similar patterns emerged. No participant in either group indicated that their opinion had declined following their involvement in the Workshop. For the two remaining response categories, the response was nearly evenly split between the "Remained The Same" and "Increased" categories for both groups, indicating that Teaching Position did not appear to have any major influence on the response for this question.

Question 3.03: "Since my attendance of the Writing Process Workshop, my willingness to implement computer applications in my classroom Language Arts program has:

( ) Declined.
( ) Remained about the same.
( ) Increased."

This question was intended as a follow-up to Question 3.02. Question 3.02 requested response concerning the opinion of the participants concerning the suitability / applicability of computers in Language Arts. Question 3.03 attempted to further define the response in terms of willingness or intent to actually put into practice the innovation promoted in the Workshop. For example, while an individual might have a high opinion of the usefulness of computers in Language Arts, that may not necessarily directly translate to a willingness to integrate them in their own classroom program. The question attempted to gain a sense of the willingness on the part of the Workshop participants to do that.

Table 76: Group Response: ". . . willingness to implement computer applications has:"

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Declined	0	0%
Remained The Same	16	47%
Increased	18	53%
Total	**34**	**100%**

Analysis:

The response to this question was once again nearly evenly split between the "Remained The Same" and "Increased" categories. Also, none of the respondents indicated that their attendance of the Workshop had negatively affected their willingness to implement computer integration in their Language Arts programs. There appeared to be a near one-to-one correspondence between the participants' positive opinion and expression of willingness regarding computer utilization in Language Arts.

This pattern was confirmed when the response data for this question was examined in terms of the Teaching Position of the Workshop participants. This is illustrated in Table 77.

As can be seen in the accompanying table, the response to Question 3.03 for the two major Workshop participant groups was nearly identical. Teaching Position did not appear to appreciably influence the participants' responses regarding their willingness to implement computer applications in their Language Arts program.

Table 77: Group Response: Willingness To Implement Computer Applications According To Teaching Position

Elementary Teachers:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Declined	0	0%
Remained The Same	11	48%
Increased	12	52%
Total	**23**	**100%**

Junior-High Teachers / Administrators:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Declined	0	0%
Remained The Same	5	45%
Increased	6	55%
Total	**11**	**100%**

Question 3.04: "Indicate to what extent your attendance of the Workshop has changed your commitment towards and advocacy of the utility of computers in the Elementary Language Arts program:

( ) No change.
( ) Minimal change.
( ) Moderate change.
( ) Substantial change."

This question was included in the survey questionnaire not only as a follow-up to Questions 3.02 and 3.03, but also to characterize how effective the Workshop was in one of its' design goals - to create a cadre of inservice leaders. In order to be an effective inservice leader, one would necessarily have to have a commitment towards the innovation being promoted by the Workshop, and also be somewhat of an advocate towards adoption of the innovation.

Table 78: Group Response: ". . . to what extent your attendance of the Workshop has changed your commitment towards and advocacy of the utility of computers in the Elementary Language Arts program:"

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
No Change	5	15%
Minimal Change	9	26%
Moderate Change	14	41%
Substantial Change	6	18%
Total	**34**	**100%**

Analysis:

Question 3.04 was phrased in such a manner as to survey the magnitude of change in commitment or advocacy, not whether the change in attitude itself was positive or negative. The results however generally reflected those trends established in the responses for Question 3.02 and 3.03, in that they showed a near even split. For Question 3.04, 41% of the respondents indicated that there had been minimal or no change in their commitment, while 59% reported that they felt there had been a moderate to substantial change. As more than half of the respondents indicated moderate to substantial change, and the nature of the change itself can be characterized as positive from reference to the respondents' written comments, the Workshop could be said to have been effective in promoting its' innovation.

When the response data was rearranged according to the Teaching Position of the respondents however, some differences between the Elementary Teachers and the Junior-High Teachers / Administrators were evident. While the trends for both groups were somewhat similar, the Junior-High / Administrator group showed a higher magnitude of change in the the moderate to substantial categories. On a percentage basis, almost twice as many Elementary teachers reported "Minimal Change" in their commitment and advocacy than did their Junior-High colleagues. Once again however, establishing whether this was positive or negative is difficult, as those reporting minimal change in might have already been strongly committed towards the concept of computer integration in Language Arts prior to their attendance of the Workshop.

Table 79: Group Response: Change In Commitment And Advocacy For Computer Applications In Language Arts According To Teaching Position

Elementary Teachers:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
No Change	3	13%
Minimal Change	7	30%
Moderate Change	9	39%
Substantial Change	4	17%
Total	**23**	**100%**

Junior-High Teachers / Administrators:

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
No Change	2	18%
Minimal Change	2	18%
Moderate Change	5	45%
Substantial Change	2	18%
Total	**11**	**100%**

Table 80: Comparison Of Responses:

CATEGORY	ELEMENTARY %	JR-HIGH / ADMIN. %
Minimal / No Change	43%	36%
Moderate / Substantial Change	57%	64%

Question 3.05: "At the present time, I would characterize the application of computers in my classroom Language Arts program as having:

( ) Declined.
( ) Remained about the same.
( ) Increased."

The question was included in the survey to gain an approximation of how effective the Workshop had been in convincing the participants in adopting the innovation that had been featured. While some indication of this given in Questions 3.02, 3.03, and 3.04, Question 3.05 focussed in on actual application of the innovation in the participants' own teaching situation.

Once again, the "Remained About The Same" response category could be somewhat deceiving, as a participant might have been a committed practitioner of the Workshop-featured innovation prior to their attendance of the Workshop. Having attained full utilization, the respondent could reasonably report their computer utilization as "remaining the same" as it was prior to their attendance.

Table 81: Group Response: ". . . application of computers in my classroom Language Arts program as having:"

CATEGORY	NUMBER OF RESP.	PERC. OF GROUP
Declined	6	18%
Remained The Same	9	27%
Increased	18	55%
Total	**33**	**100%**

Analysis:

As more than half of the respondents indicated that their application of computers in their Language Arts program had increased, the Workshop could be judged as having been effective in promoting the featured innovation. The fact that 9 of the 33 respondents (27%) stated that their computer use remained the same cannot necessarily be interpreted as a failure on the part of the Workshop however. When reasons for their response were queried, 6 of the same respondents indicated that they were being hampered by circumstances or factors beyond their control (ie. Resource Factors). Similarly, the 6 respondents who reported that their computer use had actually declined

attributed that to factors having to do with their particular teaching situation, and not being a reflection on the Workshop itself. Specific inhibitors or promoters of the innovation adoption process were surveyed in a follow-up question - Question 3.06.

As the Workshop had originally been intended for application to Elementary teachers only, the response data for this group was isolated and reconfigured to find out if it differed appreciably from that of the entire study population.

Table 82: Response Comparison: Classroom Application On The Part Of Elementary Teachers vs. Study Population

CATEGORY	ELEMENTARY%	STUDY POPULATION%
Declined	26%	18%
Remained The Same	22%	27%
Increased	52%	55%
Total	**100%**	**100%**

While the "increased use" category was very similar for both groups, the percentage of Elementary teachers reporting "decreased use" was greater than than of the study population as whole. Nearly one-quarter of the Elementary respondents reported that their computer use had declined. In absolute terms however, this was less troubling, as the "Declined" category only involved 6 respondents, 2 of whom attributed their lower usage to the fact that they were no longer teaching Language Arts.

Question 3.06: "I would attribute my response in 3.05 mainly to:

( ) Resource factors.
( ) Organizational factors.
( ) Time factors.
( ) Student Grouping factors.
( ) Personal opinion about the utility / effectiveness of computers in Elementary Language Arts.
( ) The Workshop reinforced my prior knowledge and application.
( ) The Workshop motivated me towards greater utilization."

Question 3.06 was intended as a follow-up to Question 2.05, primarily to gather reasons for the application levels reported. This information would

hopefully also help identify those influencing factors pertinent to the design of the Workshop itself, and those connected with the teaching situation of the respondent.

As some of the survey elements in Question 3.06 were not selected by any of the respondents as contributing factors, they are not reported in the following summary table.

Table 83: Summary Of Inhibiting / Promoting Factors

RESPONSE CATEGORY	REASON	NUMBER	PERC.
Declined	1. Resource / Time Factors	3	50%
	2. Not Teaching L.A.	2	33%
	3. Organizational Factors	1	17%
Remained The Same	1. Resource / Time Factors	3	33%
	2. Not Teaching L.A.	2	22%
	3. Organizational Factors	1	11%
	4. Reinforced Prior Attitudes	3	33%
Increased	1. Resource / Time Factors	5	28%
	2. Changed Personal Opinion	2	11%
	3. Provided Motivation	2	11%
	4. Reinforced Prior Attitudes	9	50%

Analysis:

From the inhibiting / promotional factors illustrated in the chart above, the following generalizations can be made:

1. The provision or non-provision of adequate resources and time had a significant impact on the adoption process as reported by the respondents. When resources and / or time allocation was limited or even reduced, the respondents indicated that their computer utilization levels declined or remained the same. In contrast, five of the eighteen respondents (28%) who indicated that their computer use had increased attributed this to the provision of more time and / or resources.

2. Those respondents who indicated that their computer use had declined or remained the same attributed the reason(s) for those situations to be circumstances connected with their teaching position, having no reflection on design elements of the Workshop.

3. Half of those respondents (50%) who indicated that their computer use had increased attributed that to the fact that their participation in the Workshop had reinforced and strengthened attitudes that they had already had prior to attending the Workshop. Another 22% gave as their main reason that the Workshop had either changed their personal opinion or had provided them with the motivation to adopt the innovation.

This data has been reorganized to show attribution in Table 84.

Table 84: Attribution of Change Factors

RESPONSE CATEGORY	REASON	Workshop Related	Non-Workshop Related
Declined	1. Resource / Time Factors		X
	2. Not Teaching L.A.		X
	3. Organizational Factors		X
Remained The Same	1. Resource / Time Factors		X
	2. Not Teaching L.A.		X
	3. Organizational Factors		X
	4. Reinforced Prior Attitudes	X	
Increased	1. Resource / Time Factors		X
	2. Changed Personal Opinion	X	
	3. Provided Motivation	X	
	4. Reinforced Prior Attitudes	X	

A pattern is clearly evident. Respondents who reported declines or the status quo ascribed them to factors solely inherent to their teaching situation. In contrast, those respondents who reported increased computer usage also reported elements of the Workshop itself that contributed to improving their computer utilization. From this perspective then, it could be said that the Workshop was effective in promoting the adoption of the featured innovation among the participants themselves. However, it must be remembered that the major purpose of the Workshop was to train inservice leaders to promote the innovation in their own jurisdictions. As has been related earlier in this Chapter, this task was for the most part unfulfilled.

Telephone Interview Follow-Up

As part of the survey questionnaire, the respondents were asked if they would like to participate in a telephone interview regarding their perceptions about the Workshop. Nine of the survey respondents indicated that they would agree to be interviewed. Due to the wide geographic distribution of the respondents however, a telephone interview format was used. This provided some advantages and disadvantages for both the researcher and the interviewee:

Advantages:

1. The researcher did not have to travel to meet the interviewees, saving travel costs and time.

2. Interviews could be conducted at a time more convenient for the interviewee (ie. early morning, during lunch breaks, late evening).

3. Due to the more "removed" nature of a telephone conversation, some respondents might be more relaxed, candid and / or forthcoming about their perceptions and opinions than they might be in a "face-to-face" meeting.

Disadvantages:

1. Technical constraints imposed by the telephone system did not allow recordings to be made of the interview sessions. This necessitated extensive notetaking on the part of the researcher. While every effort was made to make as complete written notes of the interviewee's comments as possible, some nuances may have been missed.

2. The telephone interview format did not allow judgment of the interviewee's body language and facial expression, which might have provided better contextualization of their comments.

3. Some interview participants only had a certain amount of time available in order to complete the interview. In some instances, this meant that some questions were not asked, or if asked, answered in only a brief manner.

The Interview Structure:

The telephone interviews were structured around a series of defined questions which were asked of all interviewees. The questions either directly originated from commonalities observed in the survey questionnaires, or else were included to allow the interviewees to provide further elaboration on facets of their Workshop experience that might not have been adequately covered in the survey questionnaire itself.

The nature of the Interview questions posed were as follows:

1. How was the respondent chosen to attend the Workshop?

This question was included to better characterize the feelings the respondents had prior to attending the Workshop. For example, participants who had volunteered to attend the Workshop may have had a different mind-set than those individuals who had been assigned to attend. Attendees who volunteered might have been more amenable to accepting the innovation promoted by the Workshop than those who had been assigned to attend, particularly if the "assignees" had no strong interest in computer applications in Language Arts prior to their attendance.

2. What expectations did the respondent have of the Workshop prior to attending?

The degree to which attendees felt that the Workshop was beneficial might be somewhat dependent upon how much they expected from the Workshop. For example, those attendees who had unrealized high expectations might feel that the Workshop was less worthwhile than those who came to the Workshop with low or minimal expectations.

3. Response To The Inservice:

a) To what degree did the respondent feel that a suitable balance between theory and practice had been established in the Workshop?

Teachers often have differing ideas as to the optimum balance between consideration of the theoretical aspects of an idea, and its' practical application. This question was included to determine if there was a bias towards theory or practice on the part of the respondents, and to what degree this might have influenced their appraisal of the Workshop.

b) Was the Workshop too long in duration? Too short? Of satisfactory length?

The perceived duration of the Workshop may have played a part in the respondents' evaluation of the effectiveness of the Workshop. For example, if the respondent felt that the Workshop was too long, their resulting negative feelings towards the length of the Workshop may have been transferred to the ideas being promoted by the Workshop. Similarly, if the respondents felt that the Workshop had been too short and left them without sufficient confidence or knowledge to implement the techniques promoted by the Workshop, they might once again ascribe their negative feelings towards the ideas being promoted by

the Workshop, and not the Workshop itself.

4. What Post-Inservice Support was provided?:

Many inservice efforts are often judged to be ineffective due to a lack of follow-up support. This question was included to characterize the respondents' feelings about the support (or lack of support) they had received from the following groups after attending the Workshop:
a) Teacher Colleagues
b) Local School Jurisdiction Administration
c) Alberta Education

5. What were the long term effects [of having attended the Workshop] on the respondents' teaching practice?

Ultimately, the effectiveness of an inservice effort can be judged by how successful the effort was in changing the attendees' behaviour towards adoption of the featured innovation. This is perhaps the key question of the entire interview, as it related directly to the perceived worth of having attended and participated in the Workshop.

6. Section 6 of the Telephone Interview sessions allowed the respondents to elaborate on any aspect of their Workshop experiences. Accordingly, some respondents had a lot to say in this section, while other respondents said little, indicating that their survey questionnaire characterizations were as good as their memories served them.

Interview Response Analysis:

Part A: Contextual Information About Interview Participants

Table 85: Workshop Location Attended By Respondents:

CATEGORY	NUMBER OF RESP.
Edmonton	1
Grande Prairie	2
Calgary	5
Unidentified	1
Total	**9**

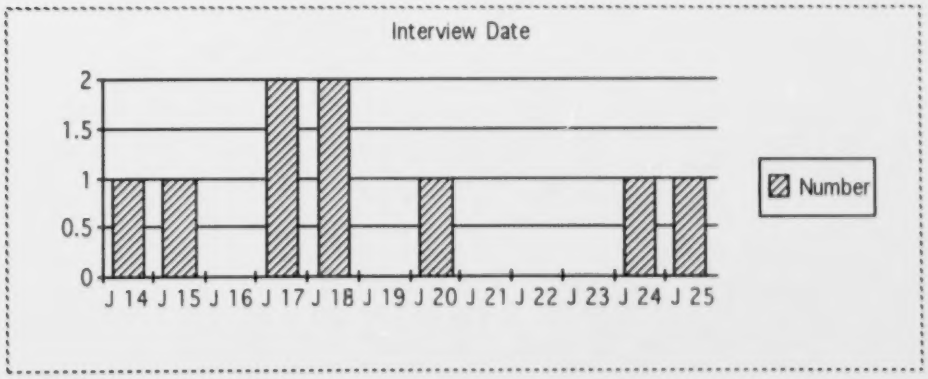
Analysis:

Participants in the follow-up interviews were volunteers from the study population as a whole. It appears that that the participants from the Calgary Workshop session were over-represented in the interview group - making up 5 of the 9 people interviewed. This over-representation will have to be kept in mind when considering the participants' responses to the interview questions, as the responses themselves will be contextualized by the Calgary Workshop.

2. Distribution Of Interview Dates:

The Follow-up Interviews were held between June 14 and June 25, 1991. As these telephone interviews were arranged at the convenience of the participant, some interviews could not be scheduled as closely together as the researcher might have wished. In any case, the majority of the interview sessions were grouped in a relatively compact time frame, to assist the researcher in attempting to ensure that each interview session was conducted in a similar manner for comparability of responses.

Figure 31: Distribution Of Interview Dates



As all of the interviews were conducted within a twelve day period, the comparability of the data would appear to be not an issue.

3. How The Interview Participants Became Involved In The Workshop:

Table 86: How the Interview Participants Became Involved

CATEGORY	NUMBER OF RESP.	PERC. OF INT. GROUP
Volunteered	6	66%
Selected	2	22%
Assigned	1	11%
Total	**9**	**100%**

Analysis:

Those participants who had volunteered to become involved in the Workshop were assumed to necessarily have a positive attitude towards the Workshop. There remained some doubt as to whether the same could also be assumed for those participants who had been selected, or assigned to attend the Workshop. As the latter group comprised 3 of the 9 interview participants, this was further investigated by comparing the participants' commitment towards computer integration Before the Workshop and their commitment After the Workshop. These characterizations are reported in Table 87:

Table 87: Interview Participant Changes In Attitude

CATEGORY	SUBJ.	ATTITUDE BEFORE	ATTITUDE AFTER
Selected	037	Moderate Approval	Full Approval
	041	Full Approval	Moderate Approval
Assigned	075	Moderate Approval	Moderate Approval

In the one case - Subject 041- where their approval rating dropped after attendance of the Workshop, this was caused by a decrease in access to computer time rather than a change in belief. The subject was still fully committed to the idea of the computer integration as demonstrated in the Workshop, but was unable to fully implement computer integration due to lack of resources.

From this perspective then, it does not appear that whether the participants were chosen, selected or volunteered made any difference in their beliefs about the value of the Workshop.

4. Characterizations Of Expectations Regarding The Workshop:

The researcher wondered whether unrealized high expectations on the part of the Workshop participants might affect their subsequent feelings about the Workshop itself, particularly relating to its value. The Interview Participants' expectations were surveyed and characterized, as reported in Table 88.

Table 88: Survey of Interview Participant Expectations of the Workshop

CATEGORY	NUMBER OF RESP.
No Expectations	0
Minimal Expectations	3
Moderate Expectations	5
High Expectations	1
Total	**9**

Analysis:

Nearly all of the interview participants expressed Minimal to Moderate Expectations of the Workshop prior to their attendance. As none of the interview participants, or any member of the study population, expressed disappointment with the Workshop, the factor of unrealized expectations can be discounted as influencing the participants' evaluation of the Workshop and its' content.

5. Reflection On The Balance Between Theory And Practice In The Workshop:

Table 89: Assessment of Balance Between Theory and Practice

CHARACTERIZATION	NUMBER OF RESP.
Poor	1
Neutral Feelings	2
Good	6
Excellent	1
Total	**9**

Analysis:

Seven out of nine (78%) of the interview participants indicated that they felt

that there had been a good or excellent balance maintained in the Workshop regarding theory and practice. As only 1 of the 9 interview subjects felt that the balance had been poor, and would have desired more practical activities, this does not appear to be an important factor influencing the interview subjects' opinions regarding the Workshop.

6. Workshop Duration:

Table 90: Interview Participant Assessment of Workshop Duration

CHARACTERIZATION	NUMBER OF RESP.
Too Long	0
Satisfactory	8
Too Short	1
Total	**9**

Analysis:

As eight of the nine (89%) interview participants indicated that the Workshop was of satisfactory duration, the duration of the Workshop did not appear to influence the participants' opinions regarding the value of the Workshop.

7. Post Inservice Support:

Table 91: Interview Participant Assessment of Program Support

CATEGORY	None	Minimal	Some	Full	Not A Concern
Colleagues	0 (0%)	2(22%)	1(11%)	0(0%)	5(56%)
Local Admin.	0 (0%)	1(11%)	1(11%)	2(22%)	5(56%)
Alberta Education	2(22%)	5(56%)	0(0%)	0(0%)	2(22%)

Analysis:

A majority of the interview respondents (56%) did not feel that the support they received from their colleagues or their local administration in implementing (or at least promoting) the Workshop innovation to be of strong concern. In contrast, 7 of the 9 interview participants characterized the post-Workshop

support they had received from Alberta Education to be "Minimal" or nil. In their comments, many of the interviewees felt that this was a major deficiency in the Workshop effort, and in some cases, felt that this lack of support after the Workshop undermined what they had attempted to do prior to attending the Workshop.

8. Long-Term Effects Of Having Attended The Workshop On Teaching Practice:

Table 92: Interview Participant Assessment of Workshop Effects

CHARACTERIZATION	NUMBER OF RESP.
Negative	1
Neutral	1
Positive	7
Total	**9**

Analysis:

Seven of the nine interviewees (78%) indicated that they felt that their attendance of the Workshop had had a positive effect on their subsequent teaching practice. The one interviewee who reported neutral feelings stated that their own developmental effort in computer integration had already surpassed what was being promoted by the Workshop, and therefore, they did not feel that what they had experienced in the Workshop itself added appreciably to their own teaching.

It should also be noted that the one interviewee who reported a negative influence, explained that this was not due to any failing on the part of the Workshop itself as it was presented, but more attributable to unrealized expectations, particularly on the part of the local jurisdiction. The local jurisdiction had interpreted Alberta Education sanction of the Workshop to signify subsequent funding for computer hardware and training. When this did not materialize, even less of local jurisdiction resources were devoted to computers, resulting in the respondent becoming demoralized and discouraged.

All in all however, it appears that a large majority of the interview participants were unanimous in their feelings that the Workshop experience had been a positive influence on their teaching practices. Indeed, a number indicated that they were still employing techniques or strategies that they had learned from the Workshop many years later.

9. Other Issues Emerging From Interview Comments:

Table 93: Emergent Issues Derived From Interview Participants

ISSUE	NO. OF RESPONDENTS
1. Alberta Education sponsorship of the Workshop created expectations on the part of teachers and school jurisdictions - later unfulfilled.	3
2. "Streaming" of Workshop attendees would have helped make the Workshop more effective.	5
3. The Workshop required follow-up to be truly effective.	7
4. The Workshop experience acted as a "reinforcer" for many of the beliefs and attitudes about computer integration held by the participants prior to their attendance of the Workshop.	5
5. More computers are needed in order to implement the strategies and activities promoted by the Workshop.	5
6. The "Hands On" activities used in the Workshop were effective as a training tool but were of no lasting benefit if sufficient computer resources are not available in schools to employ them.	3

Conclusion:

In this chapter, I investigated the following aspects of the research database:

1. I examined the Workshop participant response towards the various components of the survey questionnaire. Response data was compared from a number of different perspectives including:

a) Individual versus Group.
b) Relative position (i.e. Elementary Teacher, Administrator, Jr. High Teacher)
c) Prior experience with Language Arts and / or word processing.

While some differences were identified from among the various perspectives, the overall character of the response was generally positive and supportive towards the Workshop effort as it was presented.

2. I reviewed the supporting data collected by means of telephone interviews. I found good agreement between the telephone interview data and that gathered from the survey questionnaires.

3. I also collated and compared various elements of the study data base, looking for major themes or issues having potential impact on future inservice efforts. The issues identified are further explored in Chapter V.

Chapter V. Summary, Conclusions and Implications

Introduction:

In this chapter, I will:

1. Summarize the Survey Questionnaire Data collected in terms of:
   a) The Characteristics of the Study Population
   b) Participant Response Towards the Design and Organizational Aspects of the Workshop
   c) Participant Perceived Impact of the Workshop Experience On Subsequent Teaching Practice

2. Summarize Issues Emerging From The Telephone Interviews

3. Offer Conclusions Regarding Participant Response to the Workshop As It Was Conducted

4. Offer Recommendations Regarding The Planning and Delivery of Future Teacher Inservice Efforts In the Area of Classroom Computer Integration

5. Discuss the Significance of the Study

6. Identify Implications Arising From This Study

7. Offer Suggestions For Future Research

8. State Final Conclusions

Part 1: Summary of the Survey Questionnaire Data

A) Characterizing the Study Population:

Thirty-four Workshop participants formed the basis for this study. In comparing the study population with the general teacher population at the time, the following conclusions can be made:

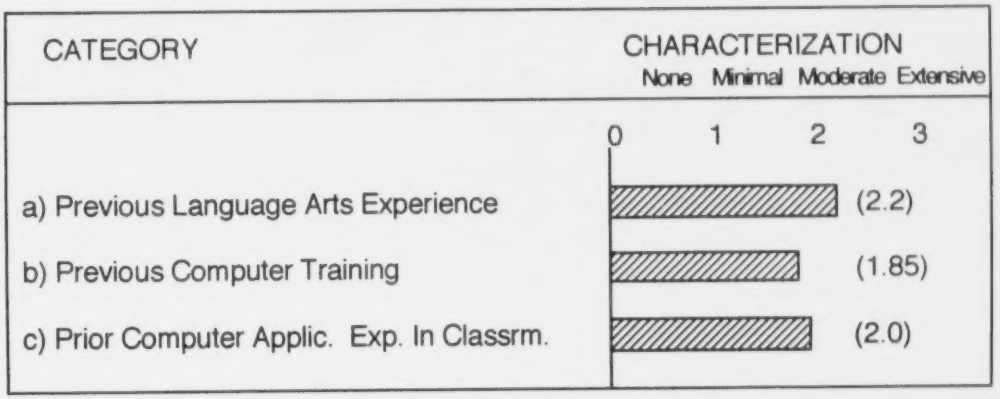
1. The study population did not match the general teaching population in gender distribution - there were more males included in the study than there were in the general teaching population at the time.

2. The study population did resemble the general teaching population in terms of:

a) the distribution of identified occupational positions (ie. the number of teachers, administrators, etc.).
b) age distribution.
c) teaching experience.
d) representation of rural and urban teachers.
e) size of school of origin.

3. In addition, the study population could be characterized in the following manner with regards to prior Language Arts and computer training and / or experience:

Figure 32: Characterization of Study Population - Prior L.A. and Computer Training and / or Experience



Note: With regards to Prior Computer Applications In the Classroom, the study population were surveyed as to their prior experience utilizing 7 different types of productivity software. Word processing experience ranked as the area with the highest group experience level.

4. The study population had a positive attitude towards computer integration prior to their involvement in the Workshop. On a scale with "Mostly In Favour" shown as +1 and "Enthusiastic Supporter" indicated by a +2, the study population (as a group) scored at +1.4.

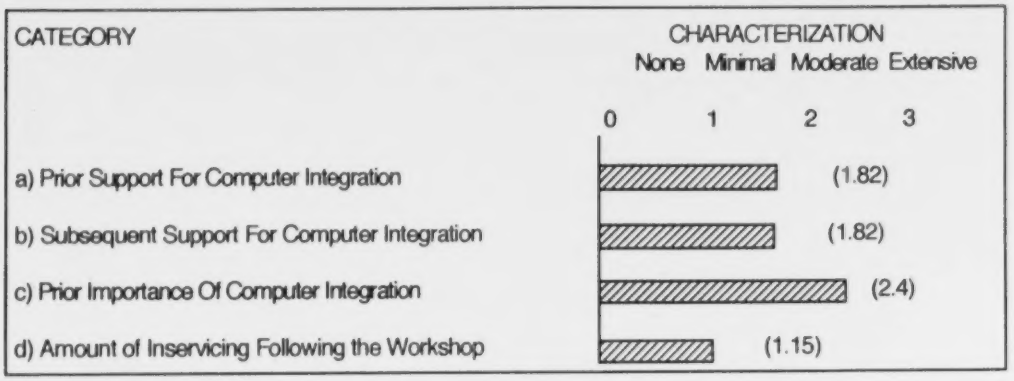
5. The study population characterized the support for computer integration they had received prior to attending the Workshop as slightly less than "Moderate" - 1.82 on a scale with +1 as "Minimal" and +2 as "Moderate." The level of support remained the same after their Workshop attendance.

6. The study population (as a group) rated computer integration to be "Moderately High" in importance prior to their attendance of the Workshop.

7. The study population characterized as "Minimal" the amount of inservicing

that was performed by the participants after attending the Workshop.

Figure 33: Characteristics / Attitudes of Study Population



B) Response Towards Design And Organizational Aspects Of The Workshop

The intent of this part of the survey questionnaire was to gain some sense of what the Workshop participants felt were effective and not so effective elements of the Workshop design and organization. Response for this section is summarized in the following section and accompanying chart, indicating group agreement or disagreement using a 5 point scale.

Reflections On The Workshop As It Was Presented:

1. The study population moderately agreed with the idea that they had gained a lot of useful information from the Workshop with their exposure to computer applications for elementary Language Arts. However, the higher the level of prior word processing experience, the less the respondents felt that they had gained from the Workshop in terms of knowledge and expertise.

2. While Elementary teachers in the study population felt that the teaching strategies demonstrated in the Workshop were more applicable to their teaching situation than did the Junior-High teachers, the study population as a whole indicated slightly less than "Moderate Agreement." The Workshop appeared to be relevant to the teaching situations of most of the participants.

3. Workshop participants with moderate Language Arts experience most felt that the "hands on" activities featured in the Workshop benefited them. They indicated "Moderate Agreement" with a statement positing "hands on" activities as being a valuable component of the Workshop. Language Arts "hands on"

activities were more favoured than computer "hands on" activities by this group. Similarly, Workshop participants with moderate to extensive computer experience also valued "hands on" activities the most.

4. The study population indicated slightly less than "Moderate Agreement" with a statement regarding that they had gained more confidence in their ability to share their [computer / Language Arts] knowledge with their colleagues through their participation in the Workshop.

5. Group characterization of the value of collaboration towards the effectiveness of the Workshop was +0.57, halfway between "Neutral" feelings and "Moderate Agreement." Group response was differentiated however, with participants having both extensive Language Arts and word processing experience valuing partnership learning the least.

6. With regards to group sharing during the Workshop, all participants felt that the group sharing sessions were a positive feature. The group was more positive towards the value of group sharing than they were of partnership learning, with their valuation of the former being +0.87 as compared to +0.57 for the latter.

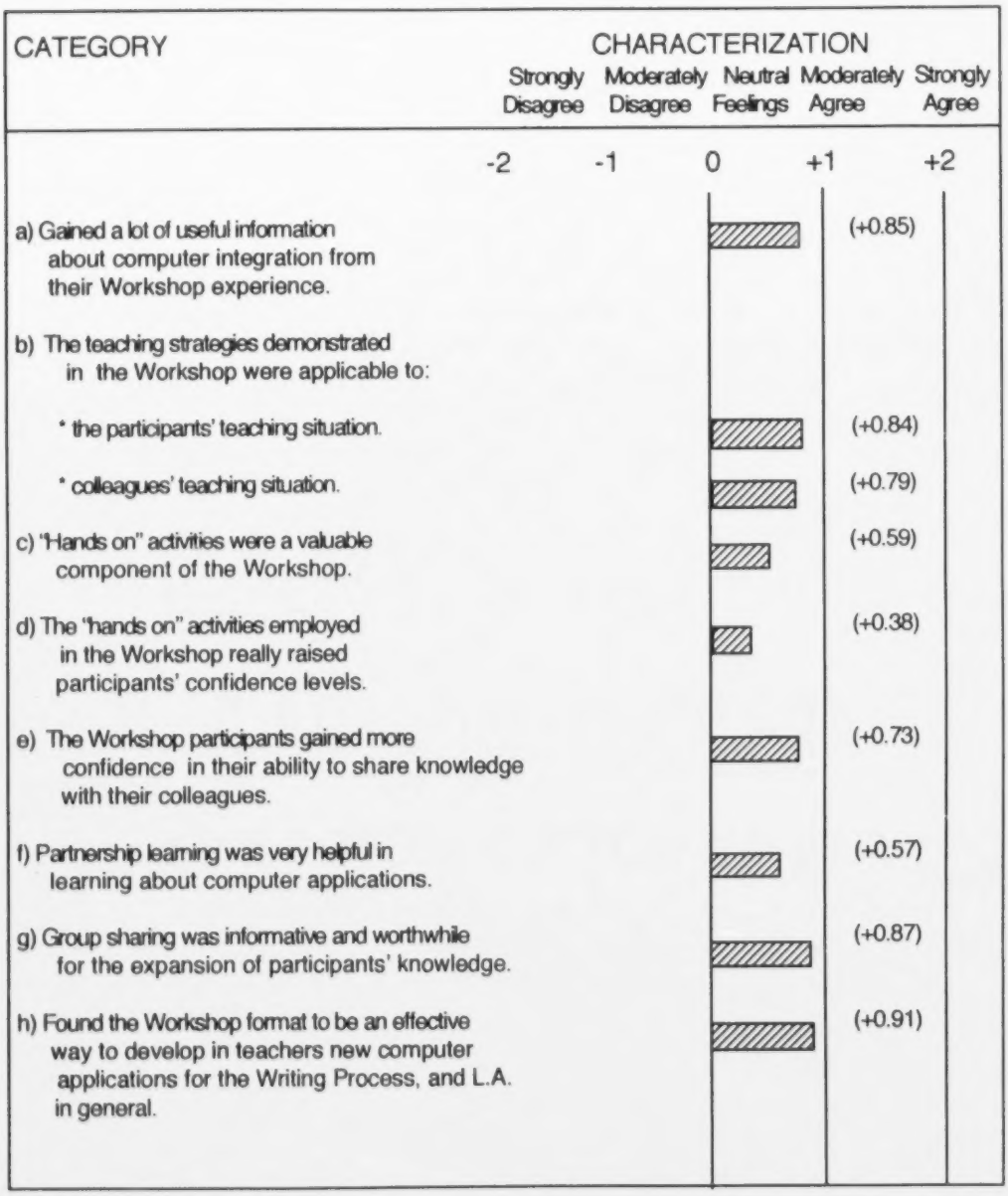
7. The study population expressed their most positive valuation for their perceived effectiveness of the Workshop (+0.91). Response concerning this aspect of the Workshop appeared to be influenced by the degree of prior Language Arts and word processing experience. Those participants with minimal Language Arts experience returned a characterization much lower than that for the whole group. Similarly, participants with minimal word processing experience responded with a characterization one half that of the study population as a whole.

Reflections On Possible Changes To Improve The Effectiveness of The Workshop:

1. Extending the length of the Workshop proved to be only marginally attractive to the survey respondents. Participants with minimal or no prior word processing experience indicated greatest agreement with the option of extending the length of the inservice. Participants with moderate word processing experience responded to the question with neutral feelings, indicating that they felt the inservice length was adequate.

2. The Gr. 7-9 teachers were the most supportive of the idea of staggering the training sessions over a longer period of time. Gr. 4-6 teachers were less supportive of this idea. For the group as a whole however, support for this idea could be described as "Reserved Agreement."

Figure 34: Summary of Participant Charcterization of Effective / Ineffective Workshop Elements


CATEGORY
CHARACTERIZATION
Strongly Disagree
Moderately Disagree
Neutral Feelings
Moderately Agree
Strongly Agree
-2
-1
0
+1
+2
a) Gained a lot of useful information about computer integration from their Workshop experience.
(+0.85)
b) The teaching strategies demonstrated in the Workshop were applicable to:
* the participants' teaching situation.
(+0.84)
* colleagues' teaching situation.
(+0.79)
c) "Hands on" activities were a valuable component of the Workshop.
(+0.59)
d) The "hands on" activities employed in the Workshop really raised participants' confidence levels.
(+0.38)
e) The Workshop participants gained more confidence in their ability to share knowledge with their colleagues.
(+0.73)
f) Partnership learning was very helpful in learning about computer applications.
(+0.57)
g) Group sharing was informative and worthwhile for the expansion of participants' knowledge.
(+0.87)
h) Found the Workshop format to be an effective way to develop in teachers new computer applications for the Writing Process, and L.A. in general.
(+0.91)

Reflections On Possible Changes To Improve The Effectiveness of The Workshop (Continued)

3. Most of the Workshop participants surveyed indicated that follow-up would have improved the effectiveness of the Workshop, although some were more positive about this than others, depending on their level of prior Language Arts and word processing experience.

4. Most of the Workshop participants surveyed indicated that the number of trainers / leaders available at the Workshop was sufficient. While the minimal experience group was the most positive towards the idea of having more trainers available, their feeling was not very strong, indicating that even they were more or less satisfied with the amount of training support provided at the Workshop.

5. Most of the Workshop participants surveyed felt that the choice of AppleWorks as the foundation software package for the Workshop was the correct one.

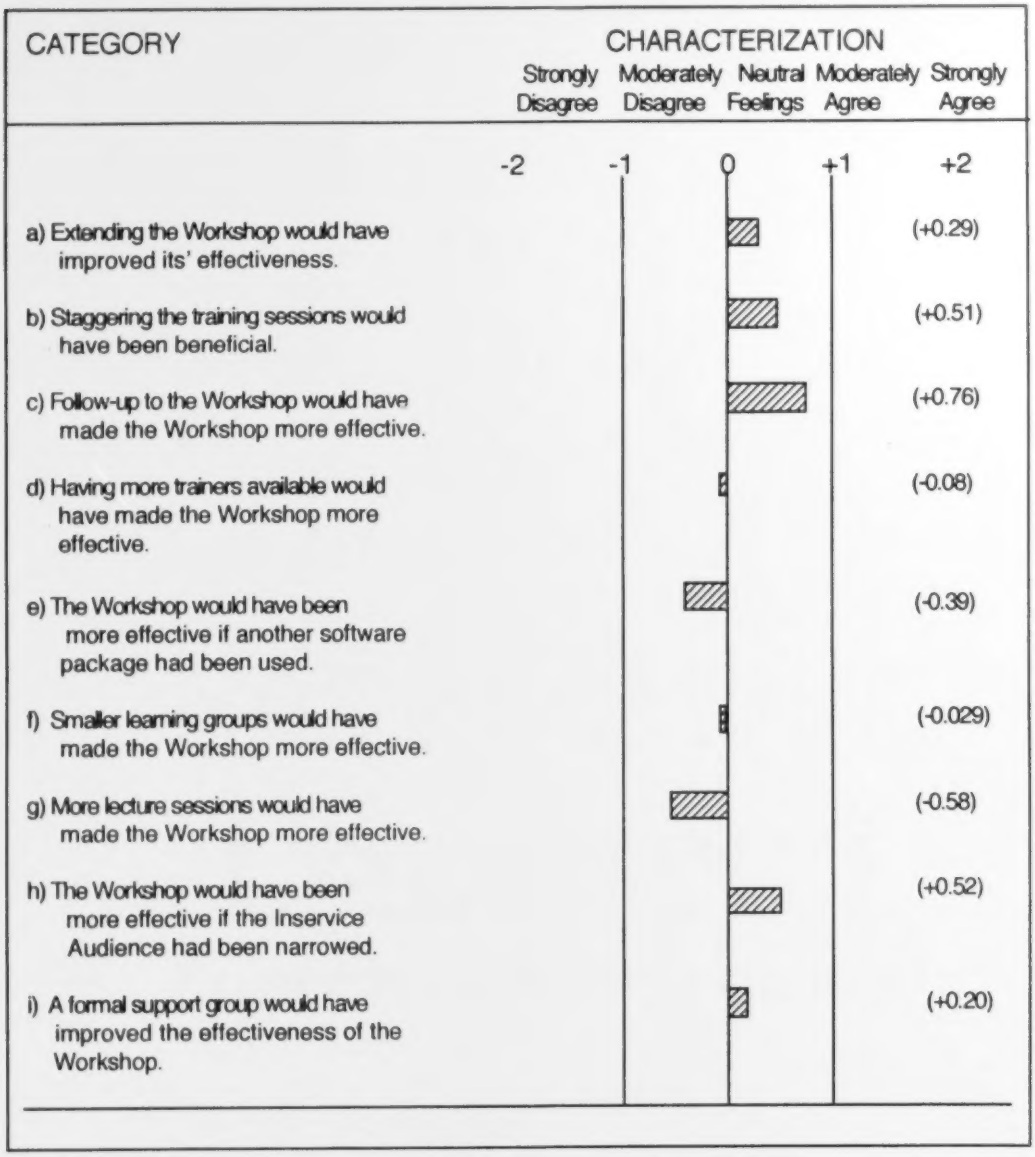
6. There was no clear consensus on the part of the Workshop participants regarding the issue of group size. Some respondents felt that smaller groups would have made the Workshop more effective while others preferred larger groups. The overall feeling on this issue was neutral.

7. On a group basis, the survey respondents disagreed with the potential value of adding more lecture sessions to the Workshop. Those respondents with the least prior experience in Language Arts or computers showed the least disagreement with the idea of added lecture sessions, while those respondents with the most prior experience most disagreed.

8. The possibility of narrowing the Workshop audience brought mixed reviews. Gr. 7-9 teachers felt the most strongly about the benefit of narrowing the Workshop audience, while the Gr. 4-6 teachers were less enamoured of that option. All of the groups surveyed however, indicated an overall preference to some degree of separating the Workshop into different sessions for different groups.

9. Establishment of a formal support group to follow-up on the Workshop also met with a mixed response. Those respondents with little or no prior computer or Language Arts experience expressed near neutral feelings towards the issue. Those respondents with moderate prior experience felt that a follow-up support group might be beneficial to some degree. Those respondents with extensive prior experience saw little need for a follow-up support group.

Figure 35: Participant Response To Possible Organizational / Design Changes to Improve the Effectiveness of the Workshop


CATEGORY
CHARACTERIZATION
Strongly Disagree
Moderately Disagree
Neutral Feelings
Moderately Agree
Strongly Agree
-2
-1
0
+1
+2
a) Extending the Workshop would have improved its' effectiveness.
(+0.29)
b) Staggering the training sessions would have been beneficial.
(+0.51)
c) Follow-up to the Workshop would have made the Workshop more effective.
(+0.76)
d) Having more trainers available would have made the Workshop more effective.
(-0.08)
e) The Workshop would have been more effective if another software package had been used.
(-0.39)
f) Smaller learning groups would have made the Workshop more effective.
(-0.029)
g) More lecture sessions would have made the Workshop more effective.
(-0.58)
h) The Workshop would have been more effective if the Inservice Audience had been narrowed.
(+0.52)
i) A formal support group would have improved the effectiveness of the Workshop.
(+0.20)

C) Perceived Impact Of The Workshop Experience On Subsequent Teaching Practice:

The third part of the survey questionnaire was designed to elicit response concerning the long term effects of having participated in the Workshop. Data was requested on five elements, with the subsequent response characterized in the following summary:

1. Application Of Knowledge Gained In The Workshop Towards Teaching Practice:

It appears that teaching position did not have any significant influence on the adoption of the Workshop innovation. In contrast, both previous Language Arts and previous computer experience did have an effect on the [innovation] adoption rate. Those participants with extensive prior experience in either Language Arts or computers, or both, indicated a high degree of innovation adoption (mid 70% to mid 80% range). Prior computer experience was a more important determinant in predicting innovation adoption levels than was prior Language Arts experience however.

2. Difficulties Encountered In Adopting The Workshop Innovation(s):

In rank order, the nature of difficulties encountered in attempting to adopt the Workshop innovations were as shown in Table 94:

Table 94: Difficulties Encountered In Adopting Workshop Innovations

RANK	NATURE OF DIFFICULTY	PERC. OF SURVEY GROUP
1st	Lack of Resources or Support	47%
2nd	Other Misc. Factors	26%
	* (Combination of 4 factors Identified)	
3rd	Not Assigned To Teach L.A.	15%
4th	Insufficient Planning Time	12%

The most most important factor inhibiting the adoption process identified by nearly half the survey respondents was the lack of sufficient resources, both in terms of computer hardware / software, and time, in the form of scheduling for computer access. Some respondents even indicated that their computer access time decreased after inservicing their colleagues on the Workshop techniques, as demands for computer time rose without commensurate provision of addition computer resources to meet those demands.

3. Personal Opinion Of Suitability / Applicability Of Computers To Language Arts:

In rank order, the changes of opinion after having attended the Workshop regarding the suitability / applicability of computers in Language Arts were are shown in Table 95:

Table 95: Changes In Opinion Regarding Suitability / Applicability of Computers In Language Arts

RANK	CATEGORY	PERC. OF SURVEY GROUP
1st	Opinion remained the same.	56%
2nd	Opinion improved.	44%
3rd	Opinion got worse.	0%

None of the survey respondents indicated that their attendance of the Workshop had affected their opinion in a negative way. The other response data for this question supports the position that the Workshop was reasonably successful in improving participant attitude / opinion about the utility of computers in Language Arts instruction. Nearly one half of the respondents indicated that they had been positively influenced by their attendance.

4. Willingness To Implement Computer Applications In Classroom L.A. Program:

In rank order, expressed participant willingness after having attended the Workshop to implement computer applications in classroom Language Arts program is illustrated in Table 96:

Table 96: Participant Willingness to Implement Computer Applications (After Having Attended the Workshop)

RANK	CATEGORY	PERC. OF SURVEY GROUP
1st	Increased	53%
2nd	Remained The Same	47%
3rd	Decreased	0%

The Workshop was successful in promoting the participants' willingness to

implement computer applications in classroom Language Arts programs. More than half of the respondents reported that they were more willing to implement computer applications after having attended the Workshop.

5. Commitment Towards And Advocacy Of Computers In Elementary L.A.:

In rank order, characterization of change in participant commitment towards and advocacy of computers in classroom Language Arts programs (after having attended the Workshop) is shown in Table 97:

Table 97: Change In Participant Commitment Towards and Advocacy of Computers In Classroom Language Arts Programs

RANK	CATEGORY	PERC. OF SURVEY GROUP
1st	Moderate Change	41%
2nd	Minimal Change	26%
3rd	Substantial Change	18%
4th	No Change	15%

Eighty-five percent of the survey respondents indicated that their Workshop experience had improved their commitment towards and advocacy of computers in classroom Language Arts programs. Fifty-nine per cent of the respondents characterized this change as "Moderate" to "Substantial." Even among those respondents who reported "minimal" or "no change," many qualified their characterizations by stating they already were firm believers in computer utilization, and therefore there was little that could change in the strength of their commitment. From this perspective then, the Workshop could be said to have made a major impact on the attendees.

6. Level Of Computer Applications In Respondents' Classrooms:

In rank order, stated participant computer application levels in personal Language Arts programs after having attended the Workshop is illustrated in Table 98.

Table 98: Stated Participant Computer Application Levels in Personal Language Arts Programs (After Having Attended the Workshop)

RANK	CATEGORY	PERC. OF SURVEY GROUP
1st	Increased	55%
2nd	Remained The Same	27%
3rd	Decreased	18%

Over half of the survey respondents indicated that their computer application levels in their personal classroom Language Arts programs had increased following their attendance of the Workshop. Of those that indicated that their computer use had remained the same, many indicated either that they were already full users of computers, or that their utility of computers was restricted because of lack of resources, or because they did not teach Language Arts. Slightly less than one-fifth of the respondents indicated that their computer use had declined after having attended the Workshop. They mostly attributed this to lack of computer resources, and not due to lessened enthusiasm or commitment on their part.

Part 2: Summary of Issues Emerging From Telephone Interviews:

The telephone interviews were used as opportunities to allow the Workshop participants to confirm, elaborate, or offer further explanation pertaining to the responses they had given on their individual survey questionnaires. As participation in the telephone interviews was voluntary however, a selection effect may have been operative as participation demanded extra time and effort, and this may have biased the telephone interview group towards those individuals who were highly committed or motivated towards computer integration.

In rank order, the following issues were identified by three or more of the nine telephone interview participants as being important aspects or deficiencies of the Workshop as it was presented.

1. Follow-Up Was Required To Make The Workshop Truly Effective

Seven of the nine (78%) participants recommended that a dedicated follow-up effort was required to make the Workshop truly effective. They felt that this would enhance the learning of all of the Workshop participants, regardless of their ability levels or prior experience with Language Arts or computer integration. It would also help participants in their own efforts to promote the

Workshop innovation in their own jurisdictions, as they could seek help or advice specific to their own situation from the support network.

2. Differentiation of Workshop Attendees According To Prior Experience Or Ability Level Would Have Helped Make The Workshop More Effective

Five of the nine interview participants (55%) specifically indicated in their comments that they would have appreciated having the Workshop participants "streamed" according to their prior experience or ability level. They felt that working with others of the same ability level would have allowed them to make more progress during the Workshop itself, and would have enhanced the overall effectiveness of the Workshop. They were annoyed with the amount of time taken up during the group discussions in resolving procedural matters which they already knew, and more specifically, in having to work with others whose level of computer ability was far below theirs. From their perspective, this acted as a "drag" on their own progress.

3. The Workshop Acted As A Reinforcer For Many Participants Who Already Had Adopted the Workshop Innovation

Five of the nine telephone interview participants (55%) offered a different view of the function and ultimate value of the Workshop. Rather than seeing the Workshop as a ground-breaking effort promoting computer integration to new users, they saw it as an affirmation of what they were already doing in their own teaching situations. They felt that this support and affirmation aspect was just as important to the ultimate propagation of computer integration throughout the educational system as was the direct "conversion" of new practitioners, and was an often forgotten aspect of change efforts. They were appreciative of the opportunity to meet others who had encountered, and continued to encounter, many of the same difficulties they had in promoting computer integration in their own school jurisdictions.

4. More Computers Are Needed In The Schools To Make Computer Integration A Feasible Prospect For Most Teachers

Five of the nine telephone interview participants (55%) specifically raised the issue of inadequate computer resources as a major factor in inhibiting computer integration. In some instances, Workshop participants were "rewarded" for their computer promotion and teacher inservicing efforts by ending up with even less computer access for their own teaching situations. Some interviewees wryly commented that they regretted having said anything about computers to their colleagues, as their own computer programs suffered due to more restricted

computer access as more teachers vied to use the fixed installed base.

5. Alberta Education Sanction Of The Workshop Created Expectations On The Part Of Teachers And Jurisdictions That Were Later Unfulfilled

Three of the nine telephone interview participants (33%) indicated that the Workshop created expectations on the part of teachers and jurisdictions that were later unfulfilled, and acted as an inhibitor to promoting computer integration. As the Workshop was the first major provincial effort in inservicing teachers in the application of computers, many teachers and some school jurisdictions thought that this effort would be followed up with a commensurate (and provincially funded) provision of hardware and software resources. Some school jurisdictions even shifted resources away from computers, thinking that this budget area would be covered by Alberta Education. When this did not occur, some computer integration efforts were subsequently hampered.

6. "Hands On" Activities In The Workshop Were Good, But Were Of No Lasting Benefit If Sufficient Computer Resources Aren't Provided In Local School Jurisdictions To Apply The Techniques Learned

Three of the nine interview participants (33%) expressed satisfaction with the "Hands On" activities used during the Workshop. They felt that while these were effective in facilitating the requisite training, their long-term benefit would be somewhat questionable if the necessary computer hardware and software resources were not provided in local school jurisdictions to allow the knowledge and expertise gained at the Workshop to be meaningfully applied.

Ranking the Participant Response Characterizations:

As can be seen from the participant response characterizations outlined, there was a good consensus formed among the Workshop participants who responded to a written survey concerning many aspects of their Workshop experience. These impressions were for the most part supported in greater depth by the individuals who volunteered for follow-up telephone interviews. The impressions are outlined in the following section in rank order (highest to lowest) - separated into two categories - those aspects having "moderate" support and those aspects having "reserved" support.

Moderate Support Characterizations:

1. The Workshop participants found the Workshop format to be an effective way to develop in teachers new computer applications for the Writing Process, and

in Language Arts in general.

2. Group sharing was informative and worthwhile for the expansion of the (Workshop) participants' knowledge.

3. The Workshop participants felt that they had gained a lot of useful information about computer integration from their Workshop experience.

4. The teaching strategies demonstrated in the Workshop were applicable to the participants' teaching situation and those of their colleagues.

5. The Workshop participants felt that they had gained more confidence in their ability to share knowledge with their colleagues.

Reserved Support Characterizations:

1. "Hands on" activities were a valuable component of the Workshop.

2. Partnership learning was very helpful in learning about computer applications.

3. The "hands on" activities employed in the Workshop really raised the participants' confidence levels.

Less of a consensus was reached among the Workshop participants however concerning possible methods to improve the overall effectiveness of the Workshop. Only those characterizations gaining "Moderate" or "Reserved" support are reported below.

Moderate Support Characterizations:

1. Follow-up to the Workshop would have made the Workshop more effective.

Reserved Support Characterizations:

1. The Workshop would have been more effective if the inservice audience had been narrowed.

2. Staggering the training sessions would have been beneficial.

Overall Impressions:

With regards to the long term effects of having participated in the Workshop, the participants offered the following impressions:

1. Prior experience in either Language Arts or computers increased the likelihood that the participants would subsequently adopt the innovation(s) featured in the Workshop.

2. The most significant factor inhibiting the innovation adoption process was the lack of sufficient resources, both in terms of computer hardware / software, and time, in the form of scheduling for computer access.

3. All of the Workshop participants indicated that their personal opinion concerning the suitability / applicability of computers to Language Arts, and their willingness to implement computer applications in classroom Language Arts programs either remained the same or improved after having attended the Workshop.

4. Eighty-five percent of the survey respondents indicated that their Workshop experience had improved their commitment towards and advocacy of computers in classroom Language Arts programs.

5. Over half of the survey respondents indicated that their computer application levels in their personal classroom Language Arts programs had increased following their attendance of the Workshop. Of those that indicated that their computer use had remained the same, many indicated either that they were already full users of computers, or that their utility of computers was restricted because of lack of resources, or because they did not teach Language Arts.

Part 3: Conclusions

The focus of this study was to examine to what degree incorporation of active collaborative "hands on" activities would improve the long-term effectiveness of inservice efforts in promoting educational innovation, particularly in the case of expanding the base of computer users among Elementary school teachers. As such, the study was more concerned with lasting impressions of having participated in an inservice of this type rather than a review of specific knowledge or expertise gained (and retained) from the inservice. While many of the participants in this study expressed concern about the accuracy of their recollections regarding specific knowledge or expertise presented in the inservice, they were much more confident in their impressions of what they perceived to be the strengths and weaknesses of the inservice effort, and of their estimation of the long-term value of having participated in the inservice. It

is these overall impressions that were used to formulate the conclusions and generalizations outlined in the following section.

In reviewing the work of other researchers concerning computer adoption by teachers, I have been struck by the many commonalities and parallels to observations made in this study. Accordingly, when appropriate, pertinent participant impressions compiled in this study will be compared to those collected by other researchers and outlined in the literature. This should assist in contextualizing the findings and conclusions.

From among those Workshop participants surveyed, the following conclusions could be drawn:

1. On Workshop Effectiveness:

The Workshop format - as presented - was an effective way to develop in teachers new computer applications for the Writing Process, and in Language Arts in general. This impression was supported by the respondents because they felt that through their participation in the Workshop:

* They gained a lot of useful information.
* They learned teaching strategies applicable to their own teaching situation as well as the teaching situations of their colleagues.
* They gained more confidence in their ability to share knowledge with their colleagues.
* They became more supportive of computer integration and this translated to higher levels of computer applications in classroom programs.

In reporting the results of similar computer inservice efforts in other North American school jurisdictions, a number of researchers have come up with teacher opinions closely resembling the aforementioned. In a small-scale study involving two experienced teachers implementing a novel computer program at the Gr. 5 and 6 level, Cumming (1988) related essentially identical teacher-participant opinions concerning their perceived changes in attitudes and teaching strategies through utilization of computers. Herrmann (1988) reported on a somewhat larger research study involving thirteen teachers. Among her findings were:

* "Eight teachers indicated they were teaching writing more now than they had before the course..."
* "Many indicated that they were using an expanded repertoire of writing activities . . ."
* "Many of them also became, as one teacher put it, "addicted to using computers."
* "Eight of the eleven responding teaching teachers stated they now use

word processing regularly for their own writing." (p. 225-226)

In communicating the results of a 1992 study involving sixty adult learners enrolled in two different computer courses, Leso & Peck also reported similar positive attitudinal shifts for those students involved in a "tool" based course, similar in many respects to the Workshop described in this study. Leso and Peck, in comparing both tool-oriented and programming-oriented computer courses, concluded that: "If the goal is to reduce the level of computer anxiety within a population in order to promote the adoption of computer-based technologies, as is the case in education, it seems wisest to attempt to accomplish this by employing a tool use course. . ." (p. 476)

Canadian researchers, Slaughter & Brown (1993), reporting on a study looking at how a group of eighteen teachers reacted to the introduction of a computer lab in their school, also had findings concerning teacher attitudes and teaching strategies concerning computers subsequent to their participation in an inservice effort that resembled those reported about the Workshop group. Slaughter & Brown indicated that: ". . . the majority of the teachers reported that the in-service training was beneficial . . ." (p. 12)

With respect to the perceived effectiveness of the Workshop effort then, the surveyed participants' responses appear to closely resemble those of other teacher and adult-learner computer students as reported by other researchers.

2. <u>On The Value of "Hands On" Learning Activities</u>:

For the most part, the study participants felt that group sharing activities in the Workshop were informative and worthwhile, and that "hands on" and partnership learning activities were valuable components of the inservice effort. This view agrees with a similar perspective offered by a number of researchers. In a 1986 assessment of teacher education and computer training, Glenn & Carrier concluded that: ". . . teaching teachers to use a word processing or grade book program is only effective if they can work individually or in pairs at a computer." (p. 75)

Similarly, Clark & Clark (1987) also emphasized the importance of "hands on" training in the planning and delivery of computer literacy courses for teachers. More recently, in a review of empirical studies involving training teachers to use computers as teaching tools, Van Dusen & Worthen (1992, p. 20) concluded that: ". . . most teachers and lab managers felt that [teacher] training should provide 'hands-on experiences,' not just lecture-style workshops."

Lesso & Peck (1992, p. 470) offered that: "Further review of studies has indicated that computer anxiety is reduced by hands-on experience with computers."

Jones & Lowe (1990), in commenting upon the essential elements of effective staff development efforts, similarly stated that: "Active participation as opposed to passive listening is essential in any activity designed to promote change in behaviour. Teachers should have the opportunities to share their own experiences and to profit from those of others." (p. 10)

This view was promoted by teachers themselves in a study by Slaughter & Brown (1993), corroborated by earlier work by Benjamin et. al. (1990), who reported that surveyed teachers suggested that staff development programs: ". . . should allow adequate hands-on practice" (p. 52)

Two additional large American and European studies also commented upon the significance of "hands-on" activities in successful inservice efforts. Scrogan (1989), reporting on the results of a massive U.S. Government sponsored Office of Technology Assessment study, identified the following as one of the five most important factors contributing to effective inservice computer education programs: "Appropriate balance between lecture and guided practice. A cycle of mini-presentations, demonstrations, and practice sessions appears to be the most effective approach." (p. 83) Scrogan also highlighted the importance of hands-on training as one of the eight keys for training success listed in the OTA report.

A large-scale Dutch study conducted by Van Tulder & Veenman (1991) involving more than one thousand teachers, school principals, and teacher-trainers regarding their inservice experiences in the years 1985 to 1987 reported that: "The survey showed that guided try-outs during the course were significantly associated with the final impact of the INSET [In-Service Education and Training] - activities." (p. 46)

So while the Workshop participants tended to corroborate the findings of researchers with regards to the value of hands-on activities in contributing towards the ultimate success of the Workshop, they also identified a subsidiary factor associated with the hands-on activities. They felt that the participants' ultimate satisfaction with the Workshop was more dependent upon their familiarity and experience levels with computer applications than the nature of the hands-on activities themselves. They offered the opinion that those Workshop participants with little or no computer experience found the collaborative learning experiences to be somewhat helpful, but also frustrating due to the mismatch in ability levels among the Workshop population. This view was also held by many of those Workshop participants who had extensive computer experience prior to their attendance of the inservice.

3. On The Importance Of An Inservice Follow-up Effort:

Many of the survey respondents felt that the entire Workshop effort would have been made more effective if there had been a formal follow-up effort. This observation matches the findings of a number of inservice researchers. Ingvarson & Mackenzie (1988, p. 141), in a study investigating factors affecting the impact of inservice courses for teachers, cited Fullan's 1982 observation that: "Follow-up support for ideas and practices introduced in in-service programs occurs in only a very small minority of cases." Jones & Lowe (1990) underscore the importance of effective inservice follow-up with their assertion that: "Staff development that is successful in changing teacher practice is a continuing process. . . It is not a single activity that is accomplished in a day or even a week." (p. 8)

Some researchers have specifically focussed on the difficulties associated with computer inservices. See (1992) identified four critical attributes to successful use of computers by teachers, with follow-up and support issues figuring prominently:

"1. on-site technical support,
2. access to adequate hardware,
3. access to appropriate types and amounts, of software,
4. long-term, sustained staff development and inservice." (p. 35)

Dupagne & Krendl (1992, p. 425) observed that: "What appeared to be lacking in many schools is the infrastructure to support and maintain computer implementation by individual teachers . . ." Budin (1991, p. 23) promotes the idea that: "Trainers' involvement with teachers should be longterm and should saturate a school."

The importance of relevant follow-up to inservice success has also been confirmed by Guskey (1986), Bond (1988), Scrogan (1989), Bishop-Clark & Grant (1991), Govier (1991), Slaughter & Brown (1993), and Charles (1993).

4. On The Prospect Of Differentiating Inservice Attendees:

Many of the survey respondents offered the opinion that the overall effectiveness of the Workshop would have been improved if more of an effort had been made to differentiate or "stream" the Workshop attendees according to prior experience with computers, and then subsequently offer different and multiple sessions focussed on the needs of specific ability groups. They felt that this would have helped all of the Workshop attendees gain the maximum amount from their Workshop experience.

Very little research to date has been conducted pertaining to the effects of previous computer training on teachers' response to and ultimate evaluation of a computer oriented course. Makuch et. al. (1992), in reporting on a computer-assisted-instruction (CAI) course, stated that: "Previous CAI experience had no main or interactive effects on cognitive achievement or time spent on the lesson. With the user-friendly CAI used in the present study, first-time CAI users performed as well as those who had previous CAI experience." (p. 207)

Much more emphasis has been placed on investigating teachers' involvement in planning and participating in inservices. Korinek et. al. (1985), in a meta-analysis of inservices included the following among fourteen "best practices": "Participants should help plan the goals and activities of the inservice training. . . Involving participants in planning is essential . . . to behaviour change inservice. Such involvement increases participants' sense of ownership, promotes a climate of joint commitment, planning, and operation, and reinforces the notion that if innovations are to be integrated into the regular routine, then teachers must take responsibility for making decisions and maintaining changes." (p. 37)

Honeyman & White (1987) avowed that: "Educators should be cautious about using short-term inservice activities which allow minimal computer contact when working with beginning adults. If it is our intent to have the computer become an integral part of the educational process in today's schools, teachers must be given enough time to learn the appropriate uses of the machine." (p. 137) Summers (1990, p. 87) reported that: ". . . negative feelings are associated significantly with lack of experience of computers." And in reporting on teacher response to a series of computer courses, Cloke & Nodder (1988) found that: ". . . some teachers had had previous experience and took to the technicalities well, but a sizeable minority found it all confusing and were still struggling with the basics several weeks afterwards. It is to be expected that teachers from such a wide background of initial experience . . . would present problems in basic competency training." (p. 148)

Some researchers have taken the view that when considering teacher computer inservice, it is essential that the participants choose the content in order to provide a better match between prior computer experience levels, and what is to be learned in the scheduled course. Broyles & Tillman (1985, p. 371) concluded that: ". . . the choice of content for training workshops is more important to teachers' acceptance of an innovation than specific training activities." Hodgson & Whalley (1990), in commenting upon what they considered to be the main approaches to the evaluation of the effectiveness of inservice courses, identified the following as one of the key elements: "The extent to which there was agreement on the purposes of the course on the part of those principally involved." (p. 10) This view was corroborated by the extensive Dutch study conducted by Van Tulder and Veenman (1991) on

effective inservice programs and activities.

In this light, it appears that the Workshop participants' concern about the lack of streaming in the initial planning of the Workshop is well founded. While some teachers were sought out by the Workshop sponsors - Alberta Education - to be involved in the planning and delivery of the Workshop, no effort was made to actually involve the participants in the planning process. While this might be understandable, considering the wide geographic separation of the various participants and the Workshop sites themselves, it did create problems. The broad divergence of teaching backgrounds and prior experience levels resulted in many of the participants making assumptions about the Workshop that had no basis in fact, creating negative feelings on the part of some attendees. These difficulties were exacerbated in some cases when individuals with little or no prior computer experience were grouped with other individuals who had extensive experience. While most Workshop participants were tolerant of this arrangement, some found it unduly frustrating, and this ultimately coloured their response to the Workshop.

5. Lack of Computer Resources Remains A Major Inhibitor Towards Computer Integration

Nearly half of the survey respondents indicated that whatever the level of their own utilization of computers in their teaching, they felt that an inadequate resource base (insufficient computers and software) was the single largest inhibitor towards the adoption of computer integration. This concern has been widely reported in the literature. In a 1986 assessment of teacher education and computer training, Glenn & Carrier put forward the somewhat pessimistic appraisal that: "Teachers often undergo training only to return to a classroom in which there are no computers or a school in which access to computers is most difficult." (p. 71)

Seven years later, Alberta Education, reporting in a 1993 study on the increase in numbers of microcomputers in use in Alberta schools offered proof that some progress has been made: "The student to computer ratio in 1993 was 10.6:1 . . . compared to 20.3:1 in 1986." (p.4)

While this progress is heartening, it still falls far below levels necessary to allow computer integration in school programs to be common practice, rather than the notable exception. Simple calculations based on prevalent Elementary classroom sizes of 25 to 30 students show that in order for an individual school to accumulate sufficient computers to support one effective computer lab, the school must have 250 to 300 students. On this basis, each student could only be allocated 150 minutes per week maximum on the computer, or about 10% of the school week. While some schools presently

comfortably exceed this allocation, others schools, depending on their size and their school jurisdiction, fall woefully short. While the issue of inequity of computer access has been for most part ignored by the majority of researchers, Cochran-Smith (1991) described it as: ". . . one of the most critical aspects aspects of the deployment of computer technology in the public schools . . ." (p. 146)

Suffice to say that concerns about access to computers are a well-documented and continuing issue. In a 1988 process perspective, Bond identified: "One persistent theme in the literature is the inadequacy of resources for microcomputer implementations." (p. 323) Govier (1991, p. 165) stated the problem succinctly: "Shortage of hardware continues to be a problem . . ." This view has been corroborated by many other researchers: Johnson & Hoot (1986), Wright & Campbell (1987), Chandra et. al. (1988), Troxel & Grady (1989), Becker (1989), Ragsdale (1989), Zammit (1992), and Slaughter & Brown (1993).

Restricted access to computers not only acts as a deterrent for teachers wishing to adopt computer integration in their classroom programs for the first time, but also for those teachers who are already committed to using computers, and wish to expand their use further. As the installed base of computers in most schools is relatively fixed on a year-to-year basis, with only modest increases in the number of available computers to be expected within any one year, promoting greater computer use on the part of new users only serves to decrease the amount of computer access for current users. Some Workshop participants reported this negative effect, which they ascribed to their post-Workshop efforts in their own schools to promote computer integration among their peers. As more teachers attempted to integrate computers into their classroom programs, Workshop attendees found that their own share of computer access became less and less.

Part 4: Recommendations:

As has been previously alluded to, in reviewing the teacher questionnaire and interview responses pertaining to this study with issues highlighted in the literature, I have found many similarities. Data from this study essentially corroborates conclusions made in a 1987 U.S. Government Office of Technology Assessment reported by Scrogran (1989) concerning teachers, technology, and training:

"1. Technology's potential is largely unexploited.
2. The role of the classroom teacher is critical.
3. Most teachers want to learn technology.

4. Adopting technology is complex.
5. Technology makes teaching more challenging before it makes it easier."

Specific recommendations pertaining to computer inservices stemming from the Workshop study also closely resemble the "Eight Keys for Training Success" identified by Scrogan (1989, p. 81) from the OTA report, which are elaborated below in a reorganized format, supplemented by findings from other researchers:

1. Refocus Teacher Computer Inservice Towards An Ongoing Process:

In a 1992 study of ways to encourage the use of microcomputers in rural schools, Borchers et. al. found that: "This study . . . demonstrated that 1-shot workshops are not as effective in changing teachers' behaviours and beliefs as continuous and comprehensive staff development projects are. It is critical that rural educators finds the resources and support needed for on-going staff development efforts. They must also identify or develop local expertise to provide on-site assistance for their teachers. Only through continuous assistance, training, support, and funding can these changes be made." (p. 389-390)

Heller & Martin (1987, p. 138) noted that: "Availability of teacher training beyond the first computer course is another way to decrease the self-directed concerns of teachers. Many teachers leave their first computer course with higher anxieties about computers than when they entered. Since the first computer course for teachers primarily addresses the information level of concern, it is clear that more training is needed by teachers after they have had a change to use the computer with their students. Many school districts are finding now that the demand for further training by teachers who have had one course is as great as the initial demand for training was five years ago."

Another proponent of ongoing staff development , Ryan (1991), in a meta-analysis of achievement effects of microcomputer applications in Elementary schools, concluded that: "Training of teachers in the application of computers in instruction can result in the increased academic achievement of students. More than 10 hours of training of teachers in the use of computers in instruction is desirable preparation to increase academic achievement of elementary school students. Less than 10 hours of training is not only unproductive, but is counterproductive. Those teachers who receive such short-term training seem to have classes that achieve substantially less than the average computer using classes, whereas teachers receiving more than 10 hours of training achieve up to 72% additional gain beyond the average computer using class."

In commenting about the ineffectiveness of the traditional "one-shot" inservice for teacher computer training, Hannafin et. al. (1987) observed that:

"Such efforts are now widespread, but most have yielded no noticeable effects. Inservice education in computer use typically involves one or more half-day workshops, which provide neither depth of understanding nor the insights needed to really understand the computer's potential in a functional sense. The time allocation for the workshops and the competing demands of day-to-day routine outside the workshop conspire to minimize the impact of such programs. Opportunity alone will not suffice." (p. 11) This view is echoed by Robinson (1992), when commenting upon the nature of successful computer integration efforts: "To be successful, they must lay the groundwork with thoughtful planning, and then they must nurture growth with on-going staff development." (p. 43)

Some might argue that a shift to ongoing teacher inservice will necessarily drive up implementation costs, adding another deterrent to computer adoption and integration in the schools. Past practice however has not proven to be effective. In a 1990 status report on computers in U.S. and Canadian schools, Collis and Martinez noted that: "It has been estimated that only about three percent of the money spent on school computers is allocated to teacher training (Adams 1989). As a result, many teachers are self-taught with respect to the computer-related content. Without specific institutional support, teachers can become frustrated and out of touch with changes in the computer field. In addition to inservice training, preservice training should be supported in teacher preparation programs." (p. 46)

The cost of inservice, heretofore mostly ignored, will have to become an essential part of a computer integration program budget.

2. Employ Effective Inservice Techniques:

A wealth of data on effective inservice practices has been collected and synthesized in the past two decades. It is now time to go beyond traditional approaches and incorporate proven elements of successful staff development to promote computer integration in schools. Troyer (1988), in wide ranging review of issues and problems in teacher computer literacy education, advocated that: ". . . the training program itself is a key element. It must have a strong focus on planning for implementation, including the development of lesson plans for using the technology in the classroom and institutional implementation plans for integrating the computers into the educational program at the school." (p. 150)

Among widely accepted effective computer inservice components are:

a) Ensuring teacher "buy-in" by offering incentives for participation, such as enhanced status or college credit, whenever possible.

b) Involving participants in planning and organizing the inservice effort.
c) While establishing an appropriate balance between lecture and guided practice, the overall emphasis should be on "hands-on" training.
d) Using credible instructors.
e) Facilitating trainer interaction with inservice participants.
f) Concentrating on the integration of computers with classroom instruction and the curriculum (across all subject areas) by providing:
    * Lesson-related materials and handouts.
    * Detailed curriculum guides and lesson plans.
    * Strategies for teaching heterogeneous classes.
g) Building in close support as a major element of the effort.
h) Establishing an ongoing monitoring system.

In a meta-analysis of 91 well-documented studies, Wade (1985) concluded that: "There is no magical combination of methods for successful inservice. Nevertheless, inservice programs that use observation, microteaching, audio and visual feedback, and practice - either individually or in some combination - are more effective than programs that do not use these methods." (p. 54)

3. Increase Computer Access Time

Ellis & Kuerbis (1991), in a review of teacher responses concerning barriers to their using computers, concluded that: "Lack of money for software and hardware sufficient to create a 'critical mass' of computer resources within each school may, along with the lack of follow-up [to workshop efforts] limit the implementation of educational computing . . ." (p. 253)

As previously reported in this study, a more recent Alberta Education review of computer use in this province underscores the ongoing impediment to computer integration created by continuing hardware/software shortages. While some progress has been made in the past decade, to the point that the present student to computer ratio is near 10 to 1, this situation makes it impractical for many teachers to proceed with full-scale computer integration efforts. Effective computer integration across all subject areas demands access to computers "on demand," whenever a particular student needs to use it as a learning or communication tool. This is very difficult to attain under the current operational constraints found in most schools, where student computer time is rationed due to the relatively rigid scheduling demanded in order to achieve maximum utilization rates. If the computer is to be effectively used as a learning or communication tool, every student needs to have assured access. To gain a perspective on the magnitude of the problem, imagine the organizational difficulties created by limiting students to using pencils or pens for 10% of the school week. Yet that is the approximate computer access time allocation most students had in the 1993 Alberta Education survey.

The outlook is not entirely bleak however. Increases to student and teacher access time to computers can be achieved through a number of ways, individually or in combination, but most principally through:

1. Improving the efficiency of present utilization through better scheduling, distribution of computers, or priorization of use. For example, keyboarding skills could be just as effectively developed on typewriters, freeing up computer time.

While improvements in utilization are possible, it must be recognized that most schools have already done everything possible to maximize the use of their computers, and that further emphasis in this area will produce only modest improvements at best.

2. Having the school jurisdiction, school, or students purchase more computers.

In times of budget cuts and fiscal restraint, this plan alternative becomes more and more difficult to pursue. A complicating factor is the fact that many computers in the current installed base in schools are approaching obsolescence, and will have to be replaced as they become unsupportable. In a 1990 study of California state schools, Main and Roberts found that: "The lowest spending category is for maintenance and services; approximately five percent of the total educational technology budget." (p. 14) The 1993 Alberta Education survey on microcomputers in Alberta schools reported: "A concern expressed by many respondents was the difficulty of working with outdated equipment that has limited performance capability." (p. 20) The Alberta Education survey cited a number of comments from respondents underlining the importance of this issue:

> "Maintenance and repair will be a problem as the machines get older; the dollars are getting tighter."
>
> "The funds are not available to keep up with technological training and purchasing computers for our system. Within our system there is an inequitable distribution of funds and software, which in the end disadvantages a number of students simple by virtue of the school they attend."
>
> "The school is in dire need of a major upgrade of computers for pupil use. Our Apple and IBM computers are outdated, software is outdated and repair costs are increasing. There is a great need to update and advance in the area of technology for elementary students." (p. 20)

When examining the components of the contemporary installed computer base in Alberta schools, for example, the importance of the hardware issue is

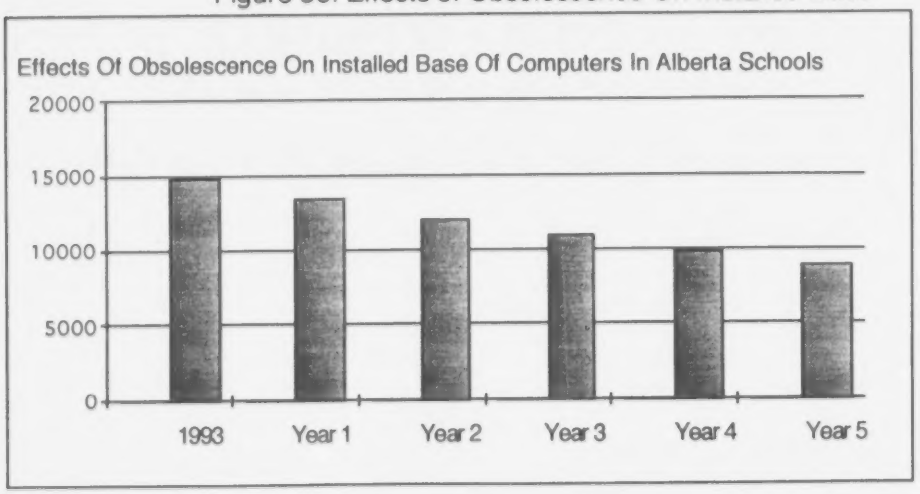
further highlighted. Alberta Education (1993) reported the distribution of computers in Alberta Elementary schools to be as shown in Table 99 - as of January of 1993:

Table 99: Distribution of Computers In Alberta Elementary Schools
* (Adapted from pie chart, p. 8)

Computer Type	Number	Percentage of Installed Base
Apple II Type	9786	66%
IBM Type	1483	10%
Macintosh Type	2076	14%
Other	1483	10%
Total	14828	100%

When it is considered that many of the computers in the installed base are already obsolete, or will become so in the near future, it is likely that schools and school jurisdictions will be faced with the prospect of replacing nearly 70% of the current installed computer base within the next five years, as these machines become increasingly expensive to repair and maintain. Spread over a five year period, a one-for-one replacement effort for these worn out machines would require that 14% of the installed base be replaced on an annual basis. When taking into account current replacement rates, predicted at 4% per year (Alberta Education, 1993), this results in a net reduction of the installed computer base of 10% per year as obsolete and no longer supportable machines are retired. This would create the following scenario:

Figure 36: Effects of Obsolescence On Installed Base



This scenario is based on the assumption that:

1. The cost of computers will be no higher than current levels.
2. Inflation rates will remain low.
3. Schools or school jurisdictions will want to devote dwindling financial resources towards computer purchases, and will be able to continue to afford to fund replacement of 4% of their computers per year.

While the future course is difficult to predict, it is certain that computer hardware/ software concerns will remain a central factor when considering the issue of computer integration in Elementary schools.

4. Stress Integration By Promoting a "Tool" Focus

Many researchers have advocated that schools should rapidly shift the focus from learning about computers to using computers as just another, but perhaps more powerful learning and communication tool. Ross et. al. (1991) cited Daiute concerning the advantages of computer as tool: "With the computer as the instrument, writing is more like talking. Writers interact with the computer instrument, while the pen and the typewriter are static tools . . . Writing on the computer means using the machine as a pencil, eraser, typewriter, printer, scissors, paste, copier, filing cabinet, memo pad, and post office. Thus, the computer is a communication channel as well as a writing tool." (p. 4)

Some researchers have taken the "tool" analogy one step further, promoting the idea that not only should computers be considered as learning and communication tools, but that by making them easy to use, their usage will increase, thus fostering educational reform. Woodrow (1991) commented that: "it is essential that school-based computers and software be as user-friendly as possible. . . computers which maximize intuitive procedures and consistent formats, will promote the support of students and teachers alike. . . It cannot be overemphasized that it is the attitudes held by teachers and students towards computers . . . that will ultimately determine the success or failure . . ." (p. 491) Collins (1991) argues that: ". . . if you have computers that are easy to understand and that are powerful tools for doing schoolwork, then people will eventually figure out how to use them." (p. 35)

With the past twenty years of experience of computers in schools as a backdrop, it may now seem seem strange to consider the computer as anything but a tool. Initially however, the emphasis was very much on learning about computers, which spawned the "computer literacy" movement. While perhaps of some value in the early days of complicated, balky, and difficult-to-use computers, "computer literacy" as a concept has clearly outlived its' usefulness.

Comparing the computer to another educational tool - the pencil - drives home the point. One wonders what might have happened in the history of civilization if the pencil had been introduced with attendant "Pencil Literacy" courses on: Components Of The Pencil, How The Pencil Is Made, Practice In Holding The Pencil, Differentiating Between Primary and HB Pencils. Yet this was exactly the way in which the computer was considered, and unfortunately, is still considered in some school jurisdictions. It is clearly now time to fully adopt a tool perspective for computers in education.

5. Establish Electronic Support Networks:

The issue of follow-up support remains a key concern for the successful implementation and expansion of computer integration efforts in the schools. Heck (1990), in a review of needed improvements for microcomputer instruction, concluded that: "Recognizing that computers will continue to impact on the curriculum and how well students learn, policymakers should explore methods of supporting teachers after their in-depth training has been completed." (p. 84) Bright (1991), in a study examining the factors influencing the effectiveness of technology inservice, found that: "For teachers who operated relatively independent of colleagues, the modeling of instructional techniques was very important; that modeling was an important way they got new information on teaching. For teachers that had supportive networks, the information . . . became more important; information is the medium of exchange in such a network, so new information created new opportunities for exchange."

Knierzinger (1988) recommends that co-operation and communication among computer-using teachers be strengthened. Bishop-Clark & Grant (1991) advocate support and encouragement for key people within a school to facilitate the communication and support necessary to implement computer adoption efforts. They describe such key people as champions, defined as "an individual who actively and enthusiastically promotes an innovation" and conclude that "a large body of research asserts that one of the strongest links to successful implementation is the presence of such a champion." (p. 323)

Hannafin et. al. (1987) suggest that one method to improve computer implementation support efforts is through the establishment of what might be described as Electronic Support Networks (ESNs). Growing from the Local Area Networks (LANs) already in place in many school jurisdictions, ESNs would offer the advantages of permitting:

1. . . . the continued use of already purchased hardware;
2. . . . the sharing of expensive hardware and software;
3. . . . more significant and pervasive impact per dollar invested in computer-related items; and

4.. . . access to significant software banks or curricula." (p. 12)

Additionally, through the use of E-Mail and telephone modems, teachers involved in computer implementation efforts could communicate with one another, requesting or offering support and advice, regardless of the geographic separation of the actual schools or districts involved. Using this strategy, no longer would the expense of traditional "in-person" conferences or inservices stand in the way of computer implementation efforts. Teacher questions and concerns could be addressed and resolved in a timely and appropriate manner.

6. Promote Teacher Personal Use of Computers:

As Kearsley & Lynch (1992) note: "A fundamental lack of belief in the innovation, however, will ultimately prove to be the death of even the best conceived plan. Users of technology need to be converted to a point of view; they need to believe that what they are being asked to do will work and that it is the best available solution to an identifiable educational problem." (p. 52) Hannafin et. al. (1987, p. 12) advocate that: "Educators must gain routine, automatic comfort with computer use, analogous to the almost unconscious steps involved in driving a car."

One way of promoting computer use by teachers is to provide support or incentives for purchase of computers for their own personal use. This was advocated by the 1987 U.S. Government OTA report. In his summary of the report, Scrogan (1989) stated that: "Sufficient evidence is appearing to indicate that teachers who have computers at home have an easier time integrating computers within their teaching. [Government and Educational authorities should] . . . Explore educator purchase programs, summer or weekend loan programs, and computers as training incentives for teachers." (p. 81)

Unfortunately, this approach has been for the most part unrealized, and in the light of foreseeable school funding restraints, may be unattainable. School computer access dedicated to teachers remains restricted. In a survey on teacher uses of computers, Alberta Education reported that: "Many schools do not yet provide a specific computer equipped preparation area for use by teachers. Only 37% [of the respondents to the survey] indicated that such a facility is available." (p. 15)

So it becomes somewhat of a chicken and egg problem. Many teachers resist using computers in their classroom programs because they lack computer skills, have doubts about their utility, or are constrained by hardware or software shortages. In order to overcome these constraints however, they have to become familiar computer users so that they can develop personal competency

and determine effective teaching practices. New and alternative sources of funding have to be sought, perhaps in partnership with private industry, in order to provide teachers with the contemporary learning tools that computers have become.

Summary of Recommendations:

1. Refocus Teacher Computer Inservice Towards An Ongoing Process
2. Employ Effective Inservice Techniques
3. Increase Computer Access Time
4. Stress Integration By Promoting a "Tool" Focus
5. Establish Electronic Support Networks
6. Promote Teacher Personal Use of Computers

Part 5: Significance of the Study:

The focus of this study was to examine to what degree incorporation of active collaborative "hands on" activities would improve the long-term effectiveness of inservice efforts in promoting educational innovation, particularly in the case of expanding the base of computer users among Elementary school teachers. While the study confirmed that teachers value "hands on" activities as a part of effective inservice, it also emphasized that provision of "hands on" or collaborative activities alone will not guarantee long term success of any staff development effort.

The study validated (or in some cases underscored the requirement for) the following aspects in the planning and delivery of an effective computer inservice for Elementary teachers:

1. Inservice participants should be involved in the planning and organization of the effort, so as to more specifically address participant training needs.

2. Staff development efforts are comprised of many elements, "hands on" collaborative / interactive activities being only one of many required to promote long-term change.

3. Computer training inservice has somewhat unique requirements, being much more dependent on the provision of adequate training resources and support over the long term.

4. The impact of inservice courses is greatest of all in the area of teachers' attitudes and knowledge levels.

5. As reported by Cumming (1988, p. 161): "A wide range of pedagogical, social, cognitive, and phenomenological issues bears on the effective adoption of computers in schools."

6. Computer inservice efforts (and subsequent computer implementation efforts in schools) continue to be adversely affected by shortages of sufficient compuer hardware and software.

7. The role of the classroom teacher remains critical in the implementation of computer adoption in schools.

Part 6: Implications of the Study:

This study examined the value of collaborative - interactive inservice in promoting computer adoption by teachers. The study found, as noted by Sandholtz et. al. (1992, p. 503), that "even when . . . teachers are willingly immersed in innovation, change is slow and sometimes includes temporary regression." There appears to be no magic solution to the difficulties involved in fully integrating computers into classroom programs. Even well intentioned and innovative inservice efforts, such as that represented by the" Writing Process Using the Word Processor Workshop" have little lasting impact on what teachers do in their classrooms. A host of associated factors, ranging from lack of resources to insufficient support, hinder real change.

Some implications arising from this study are:

1. Change efforts, particularly those involving technological innovations such as computers, are more complex than originally thought. Staff development efforts in these areas require extensive planning and long-term followup, and even this may not be sufficient to guarantee success in all cases.

2. Staff development efforts, particularly those involving computers, sometimes adversely affect those very people who have advocated and promoted innovation in the first place.

3. Computer inservice efforts can be positively or negatively affected by the levels of the participants' prior experience and training with computers. Combining high and low experience participants may create dissatisfaction on the part of both groups, and may reduce the overall effectiveness of the inservice.

4. Government or educational institutional sponsored inservice programs may

create expectations on the part of associated groups such as employees, school jurisdictions, etc. that may not be realized, resulting in disallusionment or disaffectation for the original innovation effort.

5. Computer implementation efforts in the schools may be severely impacted by the rapidly approaching mass obsolescence of early generation computers.

Part 7: Suggestions For Future Research:

1. More study needs to be conducted on effective practices for computer inservices for teachers. Specifically, the relative contribution of each inservice element towards the ultimate success of the change effort needs to be studied in greater detail, and over a longer period of time, so that valuable staff development resources can be more effectively utilized, resulting in "more bang for the buck."

2. The nature of computer learning itself - as it relates to integrated classroom programs in Elementary schools - should be studied. As advocated by Krendl & Lieberman (1988, p. 381) and confirmed by Schaudt (1989): "More research should examine the computer as an instructional tool integrated into, rather than apart from, classroom and small group activities."

3. If teachers are to be truly convinced as to the utility of computers, more studies need to be conducted to confirm the relative efffectiveness of specific computer applications (ie. word processing for storywriting) compared to traditional methods. Without a solid research base proving the superiority of computer-based methods, computer integration efforts will continue to lag.

Part 8: Final Conclusion:

I began this study with the view that the key to expediting computer integration was focussing on convincing classroom teachers of the utility of computers, and assisting them in becoming computer users. This provided the primary research focus for this study, and was framed in terms of:

> "Does exposure to word processing techniques through interactive and collaborative inservice promote teacher adoption of this computer application in their Language Arts programs?"

During the course of my investigation however, I have discovered that while teachers are an important factor in the change effort, they are not the only important factor. As noted by Branson (1990, p. 10): ". . . if we continue to ask

'How can we get teachers to use computers in their classrooms?' we will have made a fatal error and will make little improvement. 'How can technology be used to make fundamental improvements in education?' is a more appropriate question."

Some have promoted the idea of clearing up the chronic shortages of computer hardware and software in the schools as the answer to stalled computer implementation efforts. I'm not convinced. Norton (1992) offers a definitive rebuttal to this hypothesis: "Simply placing computers in schools or giving computers to teachers will not result in realizing the promises of computers as an educational method. Neither will empowering teachers or restructuring schools. Rather, one must first look to the technology itself . . ." (p. 43)

So are teachers the key to opening the logjam on computer implementation? My experience in this study has confirmed the hypothesis that they are a key element. Unfortunately, teachers are but one element, and there are many other elements - acting in combination - that must be addressed in order to successfully promote computer implementation in the schools. This was amply illustrated in this study. A particular inservice effort was examined - the Alberta Education sponsored "Writing Process Using the Word Processor" Workshop. And while an excellent inservice program was developed and subsequently delivered to an enthusiastic and receptive audience, the program ultimately failed in attaining its' design goal - of facilitating change in the schools. This serves to underscore the complexity, and difficulty, of effecting and sustaining change processes - particularly in the area of technological innovation in education. But there appears to be no alternative, for it is only through attempting change that experience - in terms of both successes and failures - can be gained, allowing for the refinement of subsequent change efforts. It is hoped that this study can contribute in some way towards the growing body of knowledge leading towards the meaningful integration of computers in Elementary schools.

BIBLIOGRAPHY

Alberta Education. (1986). **Computers in schools: A strategic planning symposium.** Edmonton, AB.: Alberta Education Media and Technology Branch.

Alberta Education. (1988). **The writing process using the word processor.** Edmonton, AB.: Alberta Education Curriculum Support Branch.

Alberta Education. (1993). **Microcomputers in alberta schools.** Edmonton, AB.: Alberta Education Policy and Planning Branch.

Anderson, J., Gess, D. & Hale, P. (1991). Collaboration: a model for turning teachers and children on to technology. **Journal Of Computing In Childhood Education**, 2(3), 21-27.

Barker, T.T. (1987). Studies in word processing and writing. **Computers In The Schools**, 4(1), 109-121.

Becker, H.J. (1991). How computers are used in united states schools: basic data from the I.E.A. computers in education survey. **Journal of Educational Computing Research**, 7(4), 385-406.

Benjamin, S., Bryant, S. & Mack, R. (1990). A research-based approach to elementary computer instruction. **Educational Technology**, 30(9), 49-53.

Berdie, D.R. & Anderson, J.F. (1974). **Questionnaires: Design and use**, Metuchen, N.J.: Scarecrow Press

Bishop-Clark, C. & Grant, R. (1991). Implementing computer technology in educational settings. **Journal of Educational Technology Systems**, 19(4), 313-326.

Blair, S.M. (1988). Survey of inservice practices in the united states and abroad. **Reading Improvement**, 25(1), 50-55.

Bond, E.A. (1988). Diversity of microcomputer implementations: a process perspective. **Journal of Research in Computing in Education**, 20(4), 321-330.

Borchers, C.A., Shroyer, M.G., & Enochs, L.G. (1992). A staff development model to encourage the use of mircocomputers in science teaching in rural schools. **School Science and Mathematics**, 92(7), 384-391.

Bosco, J. (1986). The organization of schools and the use of computers to improve schooling. **Peabody Journal of Education**, 64(1), 111-129.
Bransford, J.D., Goin, L.I., Hasselbring, T.S., Kinzer, C.K., Sherwood, R.D. & Williams, S.M. Learning with technology: theoretical and empirical perspectives. **Peabody Journal of Education**, 64(1), 4-27.

Branson, R.K. (1990). Issues in the design of schooling: changing the paradigm. **Educational Technology**, 30(4), 7-10.

Bright, G.W. (1991). Factors influencing the effectiveness of technology inservice for middle school mathematics teachers. **Computers in the Schools**, 8(1/2/3), 307-310.

Brown, S. (1980). Key issues in the implementation of innovations in schools. **Curriculum**, 1(1), 32-39.

Broyles, I. & Tillman, M. (1985). Relationships of inservice training components and changes in teacher concerns regarding innovations. **Journal of Educational Research**, 78(6), 364-371.

Budin, H.R. (1991). Technology and the teacher's role. **Computers in the Schools**, 8(1/2/3), 15-26.

Carnoy, M., Daley, H. & Loop, L. (1986). **Education and computers: Vision and reality**. Standford, CA.: Stanford University.

Carrier, C.A., Glenn, A.D., & Sales, G.C. (1985). A two level program for training teachers to use computers in the classroom. **Educational Technology**, 25(9), 18-26.

Chandra, P., Bliss, J., & Cox, M. (1988). Introducing computers into a school - management issues. **Computer Education**, 12(1), 57-61.

Charles, D. (1993). Computerized learning in the classroom. **Momentum**, 24(1), 72-73.

Clark, B.A. & Clark, W.K. (1987). Computer literacy for educators: A model. **Seventh Annual Microcomputers in Education Conference: Who's in Charge?**, Rockville, MD.: Computer Science Press

Cloke, C. & Nodder, J. (1988). Inservice in primary microcomputing - an in-depth evaluation of a course. **British Journal of Inservice Education**, 14(3), 147-149.

Cochran-Smith, M. (1991). Word processing and writing in elementary classrooms: a critical review of related literature. **Review of Educational Research**, 61(1), 107-155.

Collins, A. (1991). The role of computer technology in restructuring schools. **Phi Delta Kappan**, 73(1), 28-36.

Collis, B. & Martinez, M.E. (1990). Computers in U.S. and canadian schools: have we made progress? **ATACC Journal**, 8(1), 43-47.

Conway, E.D. & Stevens, J.C. (1991). Change through collaborative inservice education. **Illinois Teacher**, 34(5), 190-195.

Constable, H. (1986). How to succeed in innovation - stop calling inevitable difficulties failure. **Curriculum**, 7(3), 162-169.

Corbett, H.D., Firestone, W.A. & Rossman, G.B. (1987). Resistance to planned change and the sacred in school cultures. **Educational Administration Quarterly**, 23(4), 36-59.

Cosden, M.A. (1989). Cooperative groups and microcomputer instruction combining technologies. **The Pointer**, 33(2), 21-27.

Cumming, A. (1988). Change, organization, and achievement: teachers' concerns in implementing a computer learning environment. **Journal Of Educational Technology Systems**, 17(2), 141-163.

Daresh, J.C. (1987). Research trends in staff development and inservice education. **Journal of Education For Teaching**, 13(1), 3-11.

David, J.L. (1991). Restructuring and technology: partners in change. **Phi Delta Kappan**, 73(1), 37-82.

Dupagne, M. & Krendl, K.A. (1992). Teachers' attitudes towards computers: a review of the literature. **Journal of Research On Computing In Education**, 24(3), 420-428.

Ellis, J.D. & Kuerbis, P.J. (1991). A curriculum for preparing science teachers to use microcomputers. **School Science and Mathematics**, 91(6), 247-254.

Evans, P.O. & Collis, B. (1987). Breaking a conceptual bottleneck in computer application to language arts through a focus on transactional learning. **Canadian Journal of Education**, 12(3), 386-403.

Evertson, C.M. (1987). Creating conditions for learning: from research to practice. **Theory Into Practice**, 26(1), 44-50.

Fullan, M. (1983). Evaluating program implementation: what can be learned from follow through. **Curriculum Inquiry**, 13(2), 215-226.

Gardner, G. (1978). **Social surveys for social planners**. Milton Keynes, England: Open University Press.

Govier, H. (1991). IT in primary schools - the opportunities of the national curriculum. **Journal of Computer Assisted Learning**, 7(3), 162-169.

Glenn, A.D. & Carrier, C.A. (1986). Teacher education and computer training: an assessment. **Peabody Journal of Education**, 64(1), 67-80.

Gressard, C. & Loyd, B.H. (1985). Age and staff development experience with computers as factors affecting teacher attitudes towards computers. **School Science and Mathematics**, 85(3), 203-209.

Guskey, T.R. (1986). Staff development and the process of teacher change. **Educational Researcher**, 15(5), 5-12.

Halpin, D., Croll, P., Redman, K. (1990). Teachers' perceptions of the effects of in-service education. **British Educational Research Journal**, 16(2), 163-177.

Hannafin, M.H., Dalton, D.W., Hooper, S. (1987). Computers in education: ten myths and ten needs. **Educational Technology**, 27(10), 8-14.

Heck, R.H. (1990). Secondary science teachers' attitudes about microcomputer-based laboratory techniques: instructional uses and needed improvements. **Computers in the Schools**, 7(3), 71-84.

Heller, R.S. & Martin, C.D. (1987). Measuring the level of teacher concerns over microcomputers in instruction. **Education and Computing**, 3(4), 133-139.

Herrmann, A.W. (1988). Teaching teachers to use computers as writing tools. **English Education**, 20(4), 215-229.

Heywood, G. & Norman, P. (1988). Problems of educational innovation: the primary teacher's response to using the microcomputer. **Journal of Computer Assisted Learning**, 4(1), 34-43.

Hodgson, F. & Whalley, G. (1990). Evaluating the effectiveness of in-service education. **British Journal of Inservice Education**, 16(1), 10-12.

Honeyman, D.S. & White, W.J. (1987). Computer anxiety in educators learning to use the computer: a preliminary report. **Journal of Research on Computing in Education**, 20(2), 129-138.

Ingvarson, L. & Mackenzie, D. (1988). Factors affecting the impact of inservice courses for teachers: implications for policy. **Teaching and Teacher Education**, 4(2), 139-155.

Johnson, D.W. & Johnson, R.T. (1985). Cooperative learning: one key to computer assisted learning. **The Computing Teacher**, 12(3), 11-15.

Johnson, M. & Hoot, J.L. (1986). Computers and the elementary teacher. **Educational Horizons**, 64(2), 73-75.

Johnson, R.T., Johnson, D.W., & Stanne, M.B. (1986). Comparison of computer-assisted cooperative, competitive, and individualistic learning. **American Educational Research Journal**, 23(3), 382-392.

Johnston, V.M. (1987). Attitudes towards microcomputers in learning: 2. teachers and software for language development. **Educational Research**, 29(2), 137-145.

Jones, E.V. & Lowe, J. (1990). Changing teacher behaviour: effective staff development. **Adult Learning**, 1(7), 8-10.

Kearsley, G. & Lynch, W. (1992). Educational leadership in the age of technology: the new skills. **Journal of Research on Computing in Education**, 25(1), 51-60.

Kinnaman, D.E. (1990). What's the research telling us? **Classroom Computer Learning**, 10(6), 31-39.

Koohang, A.A. (1989). A study of attitudes toward computers: anxiety, confidence, liking, and perception of usefulness. **Journal of Research on Computing in Education**, 22(2), 137-150.

Korinek, L., Schmid, R., & McAdams, M. (1985). Inservice types and best practices. **Journal of Research and Development in Education**, 18(2), 33-38.

Knierzinger, A. (1989). Teacher training with and without hardware constraints. **Education and Computing**, 4(3), 217-222.

Krendl, K.A. & Lieberman, D.A. (1988). Computers and learning: a review of recent research. **Journal of Educational Computing Research**, 4(4), 367-389.

Leso, T. & Peck, K.L. (1992). Computer anxiety and different types of computer courses. **Journal of Educational Computing Research**, 8(4), 469-478.

Levin, T. & Gordon, C. (1989). Effect of gender and computer experience on attitudes toward computers. **Journal of Educational Computing Research**, 5(1), 69-88.

Mackwood, G. (1990). Daring to scratch the surface of computer literacy. **The ATA Magazine**, 70(4), 31-33.

Madsen, J.M. & Sebastiani, L.A. (1987). The effect of computer literacy instruction on teachers' knowledge of and attitudes toward microcomputers. **Journal of Computer-Based Instruction**, 14(2), 68-72.

Makuch, J.R., Robillard, P.D. & Yoder, E.P. (1992). Effects of individual versus paired / cooperative computer-assisted instruction on the effectiveness and efficiency of an in-service training lesson. **Journal Of Educational Technology Systems**, 20(3), 199-208.

Main, R.G. & Roberts, L. (1990). Educational technology in the california public schools: a statewide survey. **Educational Technology**, 30(12), 7-19.

Massoud, S.L. (1991). Computer attitudes and computer knowledge of adult students. **Journal of Educational Computing Research**, 7(3), 269-291.

McAlpine, L. (1987). Resistance to planned change: a training design case study. **Canadian Journal of Educational Communication**, 16(3), 257-264.

Mevarech, Z.R., Silber, O. & Fine, D. (1991). Learning with computers in small groups: Cognitive and affective outcomes. **Journal Of Educational Computing Research**, 7(2), 233-243.

Miller, L. (1986). Computers and the language arts: theory and practice. **Journal of Curriculum Studies**, 18(3), 285-297.

Montague, M. (1990). Computers and writing process instruction. **Computers In The Schools**, 7(3), 5-20.

Moser, C.A. & Kalton, G. (1971). **Survey methods in social investigation**. (2nd ed.). London: Heinemann Educational Books.

Nastasi, B.K. & Clements, D.H. (1993). Motivational and social outcomes of cooperative computer education environments. **Journal Of Computing In Childhood Education**, 4(1), 15-43.

Neil, R. (1985). Inservice teacher education: five common causes of failure. **Action In Teacher Education**, 7(3), 49-55.

Neilsen, A.R. (1986). Knowing by doing: an active approach to writing inservice. **Journal of Reading**, 29(8), 724-728.

Norton, P. (1992). When technology meets the subject-matter disciplines in education: part three: incorporating the computer as method. **Educational Technology**, 32(8), 35-44.

Orstein & Hunkins (1988). **Curriculum: Foundations, principles, and issues**. Englewood Cliffs, N.J.: Prentice-Hall.

Pepple, J.D. (1986). An evaluation of the influence of inservice instruction on curricullum implementation. **Journal of Vocational Education Research**, 11(3), 37-48.

Persky, S.E. (1990). What contributes to teacher development in technology? **Educational Technology**, 30(4), 34-38.

Petruk, M.W. & Alberta Education. (1986). **Minicomputers in alberta schools - 1986**, Edmonton, AB.: Alberta Education Media and Technology Branch.

Ragsdale, R.G. (1989). Teacher development: the implications of using computers in education. **Canadian Journal of Education**, 14(4), 444-456.

Reilly, J.J. (1990). Is in-service of service? **Momentum**, 21(1), 10-11.

Repman, J. (1993). Collaborative, computer-based learning: cognitive and affective outcomes. **Journal Of Educational Computing Research**, 9(2), 149-163.

Riel, M. (1989). The impact of computers in classrooms. **Journal of Research On Computers In Education**, 22(2), 180-190.

Robinson, S. (1992). Integrated learning systems: staff development as the key to implementation. **Educational Technology**, 32(9), 40-43.

Ross, S.M., Smith, L.J., & Woodson, E. (1991). The development of writing skills in a computer-intensive environment. **Journal of Computing in Childhood Education**, 2(3), 3-20.

Ryan, A.W. (1991). Meta-analysis of achievement effects of microcomputer applications in elementary schools. **Educational Administration Quarterly**, 27(2), 161-184.

Ryan, W.C. (Ed.), (1988). **Proceedings: National educational computing conference 1988**, Eugene, OR.: University of Oregon.

Sandholtz, J.H., Ringstaff, C. & Dwyer, D.C. (1992). Teaching in high-tech environments: classroom management revisited. **Journal of Educational Computing Research**, 8(4), 479-505.

Savenye, W.C., Davidson, G.V. & Orr, K.B. (1992). Effects of an educational computing course on preservice teachers' attitudes and anxiety towards computers. **Journal of Computing In Childhood Education**, 3, 31-41.

Schaudt, B.A. (1990). Teacher effectiveness and CAI: the relationship between teacher compuer usage and student achievement in reading. **Journal of Computing in Childhood Education**, 1(2), 65-81.

Schlechter, T.M. (1990). The relative instructional efficiency of small group computer-based training. **Journal Of Educational Computing Research**, 6(3), 329-341.

Scrogan, L. (1989). The OTA report: Teachers, training, and technology. **Classroom Computer Learning**, 9(4), 80-85.

See, J. (1992). Ten criteria for effective technology plans. **The Computing Teacher**, 19(8), 34-35.

Showers, B., Joyce, B. & Bennet, B. (1987). Synthesis of research on staff development: a framework for future study and a state-of-the-art analysis. **Educational Leadership**, 45(3), 77-87.

Slaughter, J.P. & Brown, D. (1993). Teachers, computers and the curriculum. **Education Canada**, 33(2), 10-16.

Sparks, G.M. (1988). Teachers' attitudes towards change and subsequent improvements in classroom teaching. **Journal of Educational Psychology**, 80(1), 111-117.

Steier, L.P. (1985). **Computer technology and education: Factors affecting policymaking**, Unpublished doctoral dissertation. University of Alberta, Edmonton.

Summers, M. (1990). New student teachers and computers: an investigation of experiences and feelings. **Educational Review**, 42(3), 261-271.

Summers, M. (1990). Starting teacher training - new PGCE students and computers. **British Educational Research Journal**, 16(1), 79-87.

Swick, K.J. (1989). Appropriate uses of computers with young children. **Educational Technology**, 28(1), 7-13.

Troyer, M.B. (1988). Issues and problems in teacher computer literacy education. **Journal of Research on Computing in Education**, 21(2), 141-154.

Troxel, D.K. & Grady, W.F. (1989). The state of educational technology in the united states of america. **International Journal of Instructional Media**, 16(1), 1-13.

Van Dusen, L.M. & Worthen, B.R. (1992). Factors that facilitate or impede implementarion of integrated learning systems. **Educational Technology**, 32(9), 16-21.

Van Tulder, M. & Veenman, S. (1991). Characteristics of effective in-service programmes and activities: results of a dutch survey. **Educational Studies**, 17(1), 25-48.

Wade, R.K. (1985). What makes a difference in inservice teacher education? a meta-analysis of research. **Educational Leadership**, 42(4), 48-54.

Whyte, M.M., Knirk, F.G., Casey, R.J. & Willard, M.L. (1991). Individualistic versus paired / cooperative computer-assisted instruction: matching instructional method with cognitive style. **Journal Of Educational Technology Systems**, 19(4), 299-312.

Woodrow, J.E.J. (1991). Teachers' perceptions of computer needs. **Journal of Research On Computing In Education**, 23(4), 475-493.

Wright, J.L. & Campbell, P.F. (1987). Teacher training: a time for perspective taking. **Education and Computing**, 3(4), 275-280.

Zammit, S. A. (1992). Factors facilitating or hindering the use of computers in schools. **Educational Research**, 34(1), 57-66.

APPENDIX A: Letter To Alberta Education

Response To: Request For Access to:
Participant List of "The Writing Process Using the Word Processor" Workshop - Spring 1989
For the Purposes Educational Research

Study Proposed By:

Richard Albert - Elementary Education Graduate Student, Univ. of Alberta
9523 - 173 Ave., Edmonton, Alta. T5Z-1Z5 457-0305

* Under the Direction of Dr. Patti Browne, Elementary Education

Purpose of Study:

In partial fulfilment of a thesis requirement, to survey the teacher participants of "The Alberta Education sponsored "Writing Process Using the Word Processor" Workshops held in the Spring of 1989. The study would be conducted to examine participant teacher adoption of the computer applications presented by the Workshops.

Study Methodology to Be Employed:

A mail-back questionaire would be sent to approximately 107 elementary teachers from throughout the province who participated in the Workshops.

The study subjects would be surveyed as to:

1. Their teaching experience with computers and/or Language Arts at the time of their participation in the Workshop.
2. What they felt they gained in personal knowledge or expertise regarding computer applications to Language Arts.
3. How they applied the knowledge or expertise that they gained towards their own teaching situation.

This would be followed up by personal interviews with 10 or so of the respondents, in order to confirm interpretation of questionaire responses, and to facilitate more elaborate response.

APPENDIX A: Letter To Alberta Education

Study Limitations:

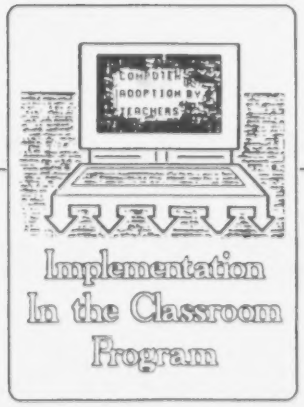
- Only elementary teachers are to be surveyed
- Study investigation will be confined to the computer expertise developed in the Workshops, and not address the primary "Inservice Leadership Training" component of the Workshops
- The study participants' identity will not be revealed in the published results of the study, and all University regulations following ethical research conduct will be followed and adhered to.

Timeframe of Study: March - August 1990

(✓) Study Approved ( ) Study Disapproved

Authorized By: John Travers
Assoc. Dir. Curriculum Support Branch

March 13, 1990



APPENDIX B: Letter From Alberta Education

Alberta
EDUCATION

Devonian Building, West Tower, 11160 Jasper Avenue, Edmonton, Alberta, Canada T5K 0L2

March 13, 1990

Mr. Richard Albert
Graduate Student
Department of Elementary Education
University of Alberta
c/o 9523-173 Avenue
Edmonton, ALberta
T5Z 1Z5

Dear Mr. Albert

Thank you for providing me with the opportunity to review your "Research Study Proposal". As I indicated to you yesterday I have no concerns about you conducting the research. I would suggest you contact the appropriate superintendents prior to contacting the teachers. I would also suggest that you highlight the focus of the study on the computer expertise developed in the workshops, rather than inservice leadership training, which was also an objective of the workshop.

Sincerely,

John Travers
Associate Director
Technology and Resource Integration Unit
Curriculum Support Branch

APPENDIX C: Letter To School Superintendents

University of Alberta — Correspondence

Richard Albert
P.O. Box 848
La Crete, Alta. T0H-2H0
June 1, 1990

[redacted]
Superintendent
Pincher Creek School Division No. 29
P.O. Box 219
Pincher Creek, AB T0K-1W0

Re: Request For Access For Educational Research

[redacted]

I am currently enrolled in a Master's Degree program (Elementary Language Arts) at the University of Alberta. As part of my thesis research, I wish to contact a teacher [redacted] in your jurisdiction who attended the Alberta Education sponsored "The Writing Process Using the Word Processor" inservice in March 1988 or 1989. My purpose in contacting this individual would be to survey their opinion as to the effectiveness of such training programs in promoting teacher use of computers. During the course of my study, I will be contacting approximately 100 other elementary teachers from across the province who also attended this series of Alberta Education inservices.

I have sought and received permission from Alberta Education to conduct this research (see attached letter), and now, as a matter of courtesy, I wish to request your official permission as well. If you wish to support this research endeavour, please sign the accompanying pre-addressed and stamped card and forward it to me.

Your assistance in this matter is very much appreciated.

Sincerely,

Richard Albert

APPENDIX D: Letter To Teachers

University of Alberta — Correspondence

Richard Albert
P.O. Box 848, La Crete, Alta T0H-2H0
December 20, 1990

Dear Teaching Colleague,

I am currently conducting field research for my Masters Degree thesis project at the University of Alberta. A major part of my research involves the Alberta Education sponsored inservice **"The Writing Process Using the Word Processor"** which you attended, and which I also participated in. My main area of interest concerns the role and effectiveness of the training inservice in initiating and developing curriculum innovation - particularly with respect to computer integration in the regular elementary classroom.

While I recognize that junior and senior-high teachers, as well as administrators, also attended the inservices, I will be focusing my research efforts on the 80 or so elementary teachers who participated. Along with yourself, I will be canvassing these elementary teachers regarding their perceptions and opinions about the value of "The Writing Process Using the Word Processor" inservice. My research methodology will involve a questionnaire-type survey followed up by selected personal interviews.

In designing this project, I have:

1. Cleared the study design and methodology with the **Ethics Review Committee** of the University of Alberta.

APPENDIX D: Letter To Teachers

2. Obtained approval from **Alberta Education** to contact **"The Writing Process Using the Word Processor"** workshop participants.

3. Obtained approval from <u>your</u> school district senior administrator to contact you.

During the course of this study, I will:

1. Endeavour to preserve your anonymity. Your identity will be known only to myself, a research assistant, and my thesis advisor. Identifying names or references <u>will not</u> appear in the published research report.

2. Offer you the option of withdrawing from this study at any time prior to publication of the research report.

With these conditions in mind, I do hope that you will consent to participate in this research study. Please follow these procedures when responding:

1. Fill out the attached questionnaire. Also indicate whether you would be willing to participate in a personal interview.

2. Place the completed questionnaire in the included pre-stamped and addressed envelope and mail it at your earliest convenience.

Thank you for taking the time from your teaching responsiblities to consider this research request.

Sincerely,

Richard Albert

Richard Albert

APPENDIX E: Survey Questionnaire

Research Questionnaire

The Writing Process Using The Word Processor

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Part 1 Background Information of Workshop Participants

Instructions:

Respond to the following with information that would have applied to you at the time you participated in the Writing Process Workshop.

Check one response for each of the following

1.00 Record what age grouping you would fit:

( ) 20 - 29 ( ) 30 - 39 ( ) 40 - 49 ( ) 50 - 59 ( ) 60 plus

1.01 Report your years of teaching experience at the time you participated in the Workshop:

( ) Under 2 years ( ) 3- 9 years ( ) 10 - 19 years ( ) 20 plus

1.02 Characterize the student population of the school in which you worked:

( ) Mostly Rural ( ) Rural/Urban mix ( ) Mostly Urban

1.03 Estimate the student population of the school in which you taught:

( ) under 50 students ( ) 51 - 99 ( ) 100 - 199 ( ) 200 - 299

( ) 300 - 399 ( ) 400 plus

1.04 Indicate the concentration of your teaching assignment:

( ) Gr. 1 - 3 ( ) Gr. 4 - 6

1.05 Characterize your previous involvement in teaching Language Arts at the Elementary level:

( ) Minimal ( ) Moderate ( ) Extensive

APPENDIX E: Survey Questionnaire

1.06 Characterize your involvement in computer inservice or computer training prior to the Workshop:

( ) None ( ) Minimal ( ) Moderate ( ) Extensive

1.07 Characterize your involvement in utilizing computers in your classroom program prior to participating in the Workshop:

( ) Nil ( ) Minimal ( ) Moderate ( ) Extensive

1.08 Characterize the nature of your computer application in your classroom program prior to the Workshop:

a) Skill development, testing, and/or remediation activities.

( ) None ( ) Minimal ( ) Moderate ( ) Extensive

b) Word processing applications.

( ) None ( ) Minimal ( ) Moderate ( ) Extensive

c) Graphics design applications.

( ) None ( ) Minimal ( ) Moderate ( ) Extensive

d) Music applications.

( ) None ( ) Minimal ( ) Moderate ( ) Extensive

e) Information processing / database / spreadsheet applications.

( ) None ( ) Minimal ( ) Moderate ( ) Extensive

f) Professional applications (classlists, mark compilation, etc.)

( ) None ( ) Minimal ( ) Moderate ( ) Extensive

g) Interactive teaching programs (ie. Oregon Trail, Where In the World Is Carmen San Diego?, etc.)

( ) None ( ) Minimal ( ) Moderate ( ) Extensive

APPENDIX E: Survey Questionnaire

1.09 Characterize your attitude towards computer integration into your classroom Language Arts program, prior to your involvement in the Workshop.

( ) Mostly against

( ) Highly doubtful of utility and effectiveness

( ) Neutral feelings

( ) Mostly in favour of

( ) Enthusiastic supporter

1.10 Characterize the amount of support (program flexibility, computer hardware, software, administrative and collegial support, etc.) that you had available to you in your teaching situation in order to integrate computers into your classroom Language Arts program, prior to your participation in the Workshop.

( ) No support

( ) Minimal support

( ) Moderate support

( ) Extensive support

1.11 Prior to attending the Workshop, what importance did you assign to integrating computers into your classroom Language Arts program?

( ) No importance

( ) Low importance

( ) Moderate importance

( ) High importance

( ) Top priority

APPENDIX E: Survey Questionnaire

1.12 Characterize the amount of support (program flexibility, computer hardware, software, administrative and collegial support, etc.) that you had available to you in your teaching situation in order to integrate computers into your classroom Language Arts program, <u>following</u> your participation in the Workshop.

( ) No support

( ) Minimal support.

( ) Moderate support.

( ) Extensive support

1.13 The original intent of the Workshop was to inservice teacher-leaders on inservicing techniques applicable to the introduction of process writing using computers. Did you personally have the opportunity to inservice other teachers in your jurisdiction? Characterize your own experience:

( ) No inservicing was performed.

( ) Minimal inservicing was performed.

( ) Moderate inservicing was performed.

( ) Extensive inservicing was performed.

End of Part 1

Part 2 begins on the next page - ->

APPENDIX E: Survey Questionnaire

Part 2: Participant Perceptions

Having participated in the Writing Process Workshop myself, I am curious about the reaction(s) of others such as yourself towards what you learned (the knowledge component), and the Workshop format (ie. small groups, independent work, large groups) that was used to impart that knowledge.

Instructions:

Indicate your degree of agreement or disagreement with the following statements by circling the number of the response which <u>most</u> closely matches your opinion. Use the following scale as an aid in making your selection:

Strongly Disgree 1
Moderately Disgree 2
Neutral 3
Moderately Agree 4
Strong Agree 5

	Statement	Opinion S.D	M.D	N.	M.A.	S.A
200	I gained a lot of useful information from my exposure to computer applications for elementary Language Arts.	1	2	3	4	5
201	I felt that the teaching strategies demonstrated during the Workshop were applicable to my teaching situation.	1	2	3	4	5
202	I felt that the teaching strategies demonstrated during the Workshop were applicable to the teaching situations of many of my colleagues.	1	2	3	4	5
203	The "hands on" approach employed during the Workshop really raised my confidence level in applying the techniques demonstrated to my teaching.	a) Language Arts expertise. 1	2	3	4	5
		b) Computer expertise. 1	2	3	4	5

APPENDIX E: Survey Questionnaire

2.04	Through the Workshop, I gained more confidence in my ability to share my knowledge with my colleagues	1	2	3	4	5
2.05	I found working with a partner during the Workshop to be very helpful for my own learning about computer applications to the writing process.	1	2	3	4	5
2.06	I found the group sharing sessions to be informative and worthwhile for the expansion of my own knowledge	1	2	3	4	5
2.07	I found the Workshop format to be an effective way to develop in teachers new computer applications for the Writing Process, and Language Arts in general.	1	2	3	4	5
2.08	I would have found the Workshop more useful if it had been of a longer duration	1	2	3	4	5
2.09	I would have found the Workshop more useful if the training sessions had been staggered over a period of months, allowing for classroom application in the intervening time	1	2	3	4	5
2.10	I would have found the Workshop more useful if it had been succeeded by a follow-up session some months after classroom application.	1	2	3	4	5
2.11	I would have found the Workshop more effective if more trainers/ leaders would have been available	1	2	3	4	5

APPENDIX E: Survey Questionnaire

2.12	I would have found the Workshop more effective if another software package other than Appleworks had been used.	1	2	3	4	5
2.13	I would have found the Workshop more effective if the groups had been smaller.	1	2	3	4	5
2.14	I would have found the Workshop more effective if the inservice had contained more lecture sessions	1	2	3	4	5
2.15	I would have found the Workshop more effective if different sessions had been arranged for Elementary and Junior/Senior High teachers.	1	2	3	4	5
2.16	I would have better assimilated and and applied the teacher strategies/ knowledge presented in the Workshop if an ongoing formal support group had been available for ongoing consultation.	1	2	3	4	5
2.17	Overall, I would recommend the Workshop format as an effective means of conveying to teachers ideas and approaches for integrating computers more fully into their classroom programs.	1	2	3	4	5

End of Part 2

Part 3 begins on the next page - ->

APPENDIX E: Survey Questionnaire

Part 3: Teaching Implications of Having Participated in the Workshop

One or more years has now passed since your participation in the Writing Process workshop. How would you characterize the lasting effects in your own personal teaching strategies, of your participation in this particular Workshop in-service?

Instructions:
Indicate your opinion by checking the response that best describes your own feeling for each of the following statements.

3.00 I would characterize my application of the knowledge I gained at the Workshop towards my own teaching practice as:

( ) Nil

( ) Minimal

( ) Moderate

( ) Extensive

( ) Full adoption and on-going development

3.01 Difficulties in applying Workshop strategies towards my own teaching practice have been mostly due to:

( ) Lack of resources (ie. insufficient computers, software, restricted access to computers etc.)

( ) Lack of organizational support (ie. scheduling constraints, Principal's non-support, colleague's non-support)

( ) Insufficient planning/implementation time

( ) Student grouping factors (ie. large class size, split grades)

( ) Personal doubts as to utility/effectiveness of the approach

( ) Impracticality of the Workshop Content and the teaching strategies presented.

( ) Other: _____

_____

_____

APPENDIX E: Survey Questionnaire

3.02 In the time since I attended the Writing Process Workshop, my personal opinion of the suitability/applicability of computers in Language Arts has:

( ) Declined

( ) Remained about the same

( ) Increased

3.03 In the time since my attendance of the Writing Process Workshop, my willingness to implement computer applications in my classroom Language Arts program has:

( ) Declined

( ) Remained about the same

( ) Increased

3.04 Indicate to what extent your attendance of the Workshop has changed your commitment towards and advocacy of the utility of computers in the Elementary Language Arts program:

( ) No change

( ) Minimal change

( ) Moderate change

( ) Substantial change

3.05 At the present time, I would characterize the application of computers in my classroom Language Arts program as having:

( ) Declined

( ) Remained about the same

( ) Increased

APPENDIX E: Survey Questionnaire

3.06 I would attribute my response in 3.05 mainly to:

( ) Resource factors

( ) Organizational factors

( ) Time factors

( ) Student Grouping factors

( ) Personal opinion about the utility/effectiveness of computers in elementary Language Arts

( ) The Workshop reinforced my prior knowledge and application

( ) The Workshop motivated me towards greater utilization

End of Part 3

Concluding *Part 4* follows on the next page - ->

APPENDIX E: Survey Questionnaire

Part 4: Personal Written Response

You may wish to expand upon any thoughts you might have about how effective the inservice format is in convincing elementary teachers to adopt computer innovations in their classroom programs. You might also want to suggest better alternatives to teacher inservicing in order to facilitate the same goals.

_____

_____

_____

_____

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_____

_____

Interview Request:

I would also be interested in conducting a personal interview with you regarding your Workshop experiences, and your perspective(s) on the inservice process. Please indicate if you would be willing to participate in a 30 - 45 minute personal interview (in person or by means of telephone contact) at a time of your convenience (January 1991 - March 1991).

( ) Yes I would be willing to participate in an interview.
School Contact Phone Number: _____

( ) No, I would not be interested in participating in an interview.

Thank you for having taken the time to relate your opinions in this survey.

Appendix F: Survey Questionnaire
Supplementary Written Comments

The following section is a compilation of the written comments provided by the survey questionnaire respondents. While some entries have been rephrased or summarized for clarification purposes, most entries are reproduced verbatim. The entries themselves are not organized according to specific topic, but are a record of whatever the participant wished to add in the open-ended "Comment" section of the survey questionnaire.

Respondent Identifier: 003

Comments:

* Suggestion: The survey questionnaire should have differentiated between inservicing performed in the school jurisdiction and that performed in the base school. S/he had the opportunity to do one but not the other.

* The response to the application of Workshop techniques question(s) may be misleading if the individual has already progressed far beyond the scope of the Workshop itself in knowledge and procedures. The same is true for the survey questions relating to personal opinion, willingness to implement, and the commitment / advocacy of computers.

Respondent Identifier: 009

Comments:

* The difficulties encountered in applying the Workshop strategies / techniques may have been due to the fact that the respondent was not a Language Arts teacher, and therefore could not have any opportunity to actually apply what s/he had learned at the Workshop.

* "I believe that computers should be used in the Language Arts area of study. As the computer teacher I encourage the use of our computer room, but since I teach no Language Arts classes I am unable to alter the teaching methods of other teachers. Also it was [a] mis-communication on the administration's part that I attended [the Workshop] since the actual topic of the workshop did not relate to my teaching load."

Respondent Identifier: 010

Comments:

* "I have interested other teachers with the effectiveness of using the computer. Consequently, I have less time available [for my own class] than beforehand."

Respondent Identifier: 016

Comments:

* "Does Print Shop count as a graphic design application?

* "As Librarian, I have had the library collection put on AppleWorks data base."

* The respondent already characterized herself as having a high degree of commitment towards computers and wondered if by answering that her commitment had remained the same, she was giving a misleading impression.

Respondent Identifier: 017

Comments:

* "Matching levels of facility with computers would be an asset [for the Workshop]. Most Language Arts teachers know the writing processes; what they want to know is how to implement it effectively. For every "in" there is an "out." Some are unwilling to accept that down the road the "in" more than makes up for the "out"."

Respondent Identifier: 020

Comments:

* "This was an excellent inservice in organization and presentation. This evaluation two years later in many cases might not be the most effective. Questions asked [in the survey questionnaire] tend to assume that participants were not "for" computer integration. The answers provided don't reflect a "positive" for the inservice if you started out supportive etc. (ie. no change, remained the same). In my case these answers would be positive but could be interpreted in a negative manner. This survey in my estimation lacks a steaming component."

Respondent Identifier: 023

Comments:

* "I was fully aware of the value of computers in Language Arts prior to attending the Workshop."

* "The Workshop was excellent. However, the procedures outlined in the Workshop could not be implemented in our school because of timeline restrictions in the computer room. We were able to get in for only one period a week (70 minutes) which I used for computer literacy and Miliken Math. In our situation the only solution would have been to install a second computer room for Grades 3 to 6 which of course was out of the question."

Respondent Identifier: 024

Comments:

* "I feel that teachers will only become enthusiastic about using computers in their classrooms if they feel comfortable and confident using them. Therefore a hands-on format is a must. Also teachers must be able to leave with a manual, and software so they can make use of what they have learned when it is fresh in their mind and they are still enthusiastic."

Respondent Identifier: 026

Comments:

* "Short intermittent workshops at a rotating set of schools might be very effective. Each participant would volunteer a practical application which they have found useful."

Respondent Identifier: 028

Comments:

* "Difficulty in applying Workshop techniques if not teaching Language Arts."

* "Hands-on approach is the best way of convincing teachers. They need the time to try all kinds of programs to find useful programs."

Respondent Identifier: 030

Comments:

* ". . . I'd be glad to help you with your research. However, I don't think I'm a suitable candidate. Your questionnaire seems to assume I'm (was) an L.A. teacher and perhaps not very familiar with computer applications. The reverse is true. I'm familiar with computers (I teach Math and Science and Computers) but I don't teach L.A. I get my students to use AppleWorks for science reports, etc."

Respondent Identifier: 035

Comments:

* "Professional applications should also include assignments, notes, etc."

* "Difficulties in applying Workshop strategies: Alberta Education time constraints for other subjects impinged on the amount of time that could be devoted to the integration of computers in[to] the L.A. program."

* "Future presenters of this Workshop should stress the practical hands-on type of information more than the theoretical constructs which is quite useless for a teacher who is in the classroom on a daily basis. The lengthy discussions of different philosophical premises should definitely be axed and removed from future Workshops. Alberta Education should design a subsidy system whereby schools could purchase more hardware and software without killing their budgets!"

Respondent Identifier: 037

Comments:

* "I feel that my attendance of the conference made me an "expert" in my school and therefore, helped me to implement more programs in both my classroom and the school. Although I haven't done much work outside my school, I have started several programs within the school. Also, since the hardware was being used more and a "need" was established, more hardware has been purchased."

Respondent Identifier: 042

Comments:

* "There is no use in having computers if access to them is not daily for writing process [as was the case] in [the] writers' workshop."

Respondent Identifier: 047

Comments:

* "We use IBM machines."

* "I was sent to it [The Workshop] because I was the computer person in the school and would likely be able to teach other teachers what I learned. But I'm not teaching Language Arts."

Respondent Identifier: 050

Comments:

* "[For some of the questions in the survey] it was so long ago I can't remember."

* "[I] don't remember any group sharing at all."

* "I enjoyed the Workshop and felt privileged to have attended. The highlight though was attendance at Donald Grave's workshop at the Computer Council Conference."

Respondent Identifier: 057

Comments:

* "I am a district consultant not based at any school in particular."

* "I promote its' [the computer's] use in all classrooms I assist in as district L.A. consultant."

* "This workshop and the manual which we were given was the best document that Alberta Education ever produced. Please find some way for the document to be reprinted and made available to more people. It would be a shame to lose

it."

Respondent Identifier: 061

Comments:

* Difficulties in applying Workshop strategies: "The following year I moved into administration at an Elementary school. The challenge was to develop [a] computer program by integrating with L.A. and inservicing teachers accordingly.

* "Schools need to develop a plan or model for integrating computers in all program areas, not just Language Arts."

Respondent Identifier: 070

Comments:

* Difficulty in applying Workshop strategies: "A large factor was leaving steady classroom teaching four months after [the Workshop] to work for Alberta Education and return to University. If I had remained I'm sure my classes would now be fully integrated with computers. I have assisted many of the student teachers I supervise to use computers in their classes."

* "Follow-up is very important."

* "[While the Workshop had been] in progress, one-on-one coaching would have been very useful."

Respondent Identifier: 075

Comments:

* "I would have found the Workshop more effective if more trainer-leaders would have been available. Available when? There were lots at the [Workshop] session but [having them] available after the session to help initiate local efforts would have been nice."

* "As per question 3.06, the Workshop reinforced previous knowledge and convictions. I've since talked with others who have taken courses along similar lines, all reinforcing the process approach. I have approached [our] local administration (Assistant superintendent + P.D. chairman) with the idea of doing

some inservice however our school division has committed large blocks of time and resources to a co-operative learning and peer coaching project, leaving little possibility for other projects."

Respondent Identifier: 076

Comments:

* Difficulties in applying Workshop strategies: "New job responsibilities."

* "The idea [of the Workshop] was good but it must be expanded. The focus and purpose of the Workshop was too vague."

Respondent Identifier: 079

Comments:

* "The Workshop was an effective means of conveying to teachers ideas and approaches for integrating computers more fully into their classroom programs but [did] not [provide] the expertise to do so! For this to happen the Department of Education and school districts must give teachers time to work and become familiar with the computer programs and systems ie. [through] networking.

* "The inservice format is suitable for the introduction of ideas, to improve attitudes and awareness of programs, however, it my belief that most teachers will not sacrifice their students' chances of gaining knowledge by bumbling through programs the teacher is unfamiliar with and therefore do not use them. I believe inservice time must be given by districts so that teachers can become familiar with the programs before they begin instructing a class of students with that program."

Respondent Identifier: 082

Comments:

* "I have had the opportunity to give several inservice sessions and I have found that if teachers are given practical hands-on experience and some suggestions for further activities and classroom management that they have gone ahead to more computer use in their writing program."

Respondent Identifier: 085

Comments:

* "The inservice was very interesting and helpful to me. As I was in the early group (March 88) it was helpful to meet so many teachers who were knowledgeable about computers and their application to the classroom. Since the inservice I have purchased a Macintosh, joined ATACC and participated in the Geography game. Resources in the classroom will have to improve to bring students to the computer at home and in school."

APPENDIX G: Telephone Interview Follow-Up Comments: Interview Transcripts

Summarized transcripts of the Interviewees' conversations with the researcher follow in this section. While the same questions were asked of all of the interviewees, some chose not to answer the questions posed, or indicated that they did not feel that the question was important to them. For instances such as these, the abbreviation (N / A) is used in the written record to denote "Not Applicable."

Subject: 010 **Interview Date:** June 14, 1991
Workshop Session Attended: Not identified.

1. How chosen to attend the Workshop?
(**X**) Volunteered ( ) Selected ( ) Assigned

2. Expectations of the Workshop?
The respondent hoped that Alberta Education sanctioning of the Workshop would signify a new initiative in the area of educational computing, and that this would be followed up with higher levels of resources and support.

3. Response to the Workshop:
a) Perceived balance between theory and practice?
Not too concerned with this aspect. Was more concerned that the Workshop appeared to "cater" to the Language Arts elements of the Writing Process than the computer dimension.

b) Duration:
( ) Too Long? ( ) Too Short ( ) Satisfactory

* Not really considered as an important factor. What the respondent considered as more important was the provision of sufficient resources to support computer integration. This was done at the Workshop.

4. Post-Inservice Support Received From:
a) Colleagues? Minimal. Colleagues recognized that computers were an area of special interest on the part of the respondent.

b) Local Administration? None. The school district administration expected

Alberta Education to provide additional funding and support for computer integration. When this was not forthcoming, the administration decided to focus on other priorities.

c) Alberta Education? None. In fact, the fact that Alberta Education sanctioned the Workshop itself created expectations that were subsequently unfulfilled.

5. Long Term Effects on teaching practice?
(Was attending the Workshop worthwhile in terms of the personal time and effort invested?)

No. As more teachers became interested in utilizing computers, and as no additional funding for computers was provided, access to computers at the school level became even more restricted. In some ways, the respondent wished that the Workshop had never happened.

6. Detailed Explanations of Survey Questions:
a) Program support provided following the Workshop?

Minimal. Alberta Education had been requested by the local school jurisdiction to make an analysis of the system's computer needs. A report was prepared but the recommendations were not followed up by the School Board, as the report was tabled, pending additional funding. This was both frustrating and disappointing to the respondent, as this decision impacted on all subsequent computer funding deliberations. As a result, student access to computers continues to be restricted in the jurisdiction.

b) Opportunity to inservice other teachers?

None. The jurisdiction expected Alberta Education to make a funding initiative to realize the recommendations that they had made in a report to the local School Board. When this funding was not forthcoming, spending in this area was put on hold.

c) Perceived benefit of "hands-on" approach?

While the "hands-on" activities were good, the respondent felt that there weren't enough of them, and those that were provided spent more time on the Language Arts aspects than on developing computer expertise.

d) Would the Workshop have been more effective if it had been of a longer duration?

Probably not. In fact, the respondent felt that the effectiveness of the

Workshop was probably more connected to the availability of sufficient resources than the design of the Workshop itself. The respondent contrasted the level of resources (hardware and software) provided at the Workshop with that available in his school, and despaired of ever being able to do what he had seen demonstrated at the Workshop. The level of resources at his school were insufficient to even attempt the Workshop Writing Process program, much less sustain it.

e) Would the Workshop have been more effective if the sessions had been staggered at different times through the year?

Mostly agree. The respondent felt that this would be dependent on the ability and experience level of the participants. For example, someone with little [computer] experience would probably benefit from a staggered approach, while someone with a lot of experience wouldn't need it. Perhaps this problem could be avoided by "streaming" the participants according to experience level.

f) Would the Workshop have been more effective if follow-up had been provided?

Mostly agree. The respondent personally did not feel confident enough to provide a full inservice session in his own jurisdiction. He felt that a team approach should have been stressed instead of depending on individual initiative.

g) Would the Workshop have been more effective if more trainers had been provided?

Mostly agree. The respondent felt that there weren't enough trainers provided, particularly when considering the varying levels of participant computer and Language Arts training.

h) Would the Workshop have been more effective if another software package had been used instead of AppleWorks?

Strongly agree. The respondent attended the Workshop with a number of misperceptions about the software to be used.

i) Would the Workshop have been more effective if the learning groups had been smaller. (ie. limited to 2 persons per group)?

Mostly agree. The respondent had a personal preference for working with a partner instead of working with a larger group. He felt that larger groups tended to slow the learning process down, particularly when working with one

computer.

Subject: 024 **Interview Date:** June 25, 1991
Workshop Session Attended: Edmonton

1. How chosen to attend the Workshop?
(**X**) Volunteered ( ) Selected ( ) Assigned

The year prior to the Workshop, the respondent read a brochure from Alberta Education concerning the inservice. She endeavoured to follow this up so that she could attend.

2. Expectations of the Workshop?

* Had no real expectations concerning the Workshop.
* The Workshop interested her because she had had extensive involvement with writing development efforts and was curious to find out how this particular inservice would approach the subject.
* She didn't receive any information prior to the Workshop itself so she was somewhat unsure as to the direction the inservice would take.

3. Response to the Workshop:
a) Perceived balance between theory and practice?

Generally pleased with the balance between theory and practice in the Workshop. She was particularly pleased to have an opportunity for personal journal writing in the session, as this inservice element supported her own ideas about the writing process.

b) Duration:
( ) Too Long? ( ) Too Short (**X**) Satisfactory

The respondent felt that staggering the sessions over a longer period of time would have been helpful however.

4. Post-Inservice Support Received From:
a) Colleagues? More or less indifference. An unstated attitude of "There she goes [to another inservice] again."

b) Local Administration? Some support, but not enough computers available in

the school to really establish an effective program.

c) Alberta Education? No other support other than the list of the Workshop attendees was provided. Effective follow-up was a definite need identified by the respondent for this inservice effort.

5. Long Term Effects on teaching practice?

(Was attending the Workshop worthwhile in terms of the personal time and effort invested?)

In the respondent's opinion, "definitely worthwhile."

6. Detailed Explanations of Survey Questions:

a) Program support provided following the Workshop?

Prior to attending the Workshop, the respondent wasn't too interested in utilizing computers in her classroom, as exposure to "skill and drill" type software had "turned her off." A teaching colleague convinced her of the utility of computers and eventually they co-developed their own interactive word processing program. This experience turned the respondent into an enthusiastic supporter of computers in the classroom, even though at the time, she had only one computer available, which she had to share with another class. This didn't bother her so much, as she preferred to have the computer as an integral part of the classroom rather than being set up in a "lab." As time went on however, she began to see the lack of hardware availability (only 24 computers in the school) as a liability, as well as the increasing level of troubleshooting difficulties being caused by computers being shared between classrooms.

After attending the Workshop, when she subsequently sought to have more computers and software provided, this was limited by higher priorities in the school.

b) Opportunity to inservice other teachers?

The respondent initially contacted the local jurisdiction Central Office and requested support to set up a series of inservices in the jurisdiction. This request was denied so the respondent restricted her efforts to her own school, where she was able to conduct some inservicing with colleagues.

c) Perceived benefit of "hands-on" approach?

Effective for training purposes, but actual application of the techniques learned demand that sufficient resources are available at the school level. If this is not done, then the value of the "hands-on" training, and the inservice effort itself is depreciated.

d) Would the Workshop have been more effective if it had been of a longer duration?

Dependent on proficiency levels of the attendees. Those that were already proficient prior to the inservice would not need further training, while those attendees who were at an earlier stage of learning might be helped by a longer session.

e) Would the Workshop have been more effective if the sessions had been staggered at different times through the year?

The respondent felt that this would have been very beneficial, as this would have allowed the experience base of the teachers involved to be further developed, providing more insight into resolving problems.

f) Would the Workshop have been more effective if follow-up had been provided?

As explained in e), the respondent felt that monthly meetings or meetings held every two months would have been more efficient.

g) Would the Workshop have been more effective if more trainers had been provided?

N / A

h) Would the Workshop have been more effective if another software package had been used instead of AppleWorks?

N / A

i) Would the Workshop have been more effective if the learning groups had been smaller. (ie. limited to 2 persons per group)?

N / A

Subject: 030 **Interview Date:** June 17, 1991
Workshop Session Attended: Grande Prairie

1. How chosen to attend the Workshop?
(**X**) Volunteered ( ) Selected ( ) Assigned

The respondent was a recently appointed Principal at the time, so he was interested in improving the integration of computers in his school.

2. Expectations of the Workshop?

Basically, anything that might be useful.

3. Response to the Workshop:
a) Perceived balance between theory and practice?
Reasonably well balanced.

b) Duration:
( ) Too Long? ( ) Too Short (**X**) Satisfactory

4. Post-Inservice Support Received From:
a) Colleagues? Not really applicable, as the respondent was the Principal at the time, so no one would question his attendance of the Workshop.

b) Local Administration? Had informal support from his Assistant Superintendent.

c) Alberta Education? None.

5. Long Term Effects on teaching practice?
(Was attending the Workshop worthwhile in terms of the personal time and effort invested?)

The respondent questioned whether the Workshop was in fact "preaching to the converted", as he felt that most of the attendees already had some experience using computers. If that was the case, did the Workshop really do any good [in promoting computer use among teachers]?

The respondent did feel however that the Workshop did add some "respectability" to the concept of integrating computers more fully into the curriculum, due to the fact that it was sponsored by Alberta Education.

6. Detailed Explanations of Survey Questions:
a) Program support provided following the Workshop? No change from those levels provided before attending the Workshop.

b) Opportunity to inservice other teachers? Minimal, primarily due to the amount of time taken up by principalship duties. The respondent felt his role was to be an "advocate" for computer integration - "selling" the merits of computers to teachers.

c) Perceived benefit of "hands-on" approach? N / A

d) Would the Workshop have been more effective if it had been of a longer duration? N / A

e) Would the Workshop have been more effective if the sessions had been staggered at different times through the year? Not necessarily staggered, but a different grouping arrangement might have been better. For example, if a session had been designated just for elementary teachers, then all of the Workshop ideas could have been focussed on that audience. Similarly for Junior-High teachers or administrators.

f) Would the Workshop have been more effective if follow-up had been provided? N / A

g) Would the Workshop have been more effective if more trainers had been provided? N / A

h) Would the Workshop have been more effective if another software package had been used instead of AppleWorks? N / A

i) Would the Workshop have been more effective if the learning groups had been smaller. (ie. limited to 2 persons per group)? N / A

Subject: 037 **Interview Date:** June 15, 1991
Workshop Session Attended: Calgary

1. How chosen to attend the Workshop?
( ) Volunteered (**X**) Selected ( ) Assigned

Her Principal forwarded her name to the jurisdiction Superintendent, who then passed it along to Alberta Education for registration.

2. Expectations of the Workshop?

* Excited over the "prospect" of gaining additional expertise in working with computers for classroom application.
* Anticipated getting a package of "stuff" which she could selectively apply to

her own classroom situation.

3. Response to the Workshop:

a) Perceived balance between theory and practice?

The respondent felt that this might be dependent upon the individual background of the attendee.

b) Duration:

( ) Too Long? ( ) Too Short ( ) Satisfactory

Once again, dependent upon the background of the individual attendee.

4. Post-Inservice Support Received From:

a) Colleagues? Neutral. No support or interference provided.

b) Local Administration? Positive. More hardware and software was subsequently purchased. The school embarked on a program of computer hardware and software acquisition in subsequent years.

c) Alberta Education? No finished handbook was provided. A disappointment.

5. Long Term Effects on teaching practice?

(Was attending the Workshop worthwhile in terms of the personal time and effort invested?)

* No direct benefit to the respondent's classroom program, as she had already incorporated many of the Workshop elements prior to her attendance of the Workshop.

* The respondent did feel that attending the Workshop improved her confidence levels however, making her more willing to embark on further developments. In this way, the Workshop served as a "build-on" motivator.

6. Detailed Explanations of Survey Questions:

a) Program support provided following the Workshop?

* More hardware and software was purchased.
* More teachers in the school appeared willing to use computers in their classroom programs.
* A daily 12 minute writing program was expanded to a total writing program.

b) Opportunity to inservice other teachers? Minimal.

The jurisdiction Deputy Superintendent expected Alberta Education to provide money for further inservicing within the jurisdiction. When this money was not forthcoming, jurisdictional inservicing was not carried out. At the school

level, some inservicing was done by the respondent, but only some teachers were involved. On this basis then, the Workshop could be said to have not fulfilled its' objectives.

c) Perceived benefit of "hands-on" approach?

While the "hands-on" strategies employed in the Workshop were good, the respondent felt that more information about the writing process was needed in order to better contextualize the "hands-on" activities that were conducted.

d) Would the Workshop have been more effective if it had been of a longer duration?

The respondent felt that this was dependent upon the experience level of the attendee in both Language Arts and computers at the beginning of the Workshop. She felt that those attendees with little or no experience in one or the other of these elements would become frustrated, so that any positive effects of extending the Workshop would be negated.

e) Would the Workshop have been more effective if the sessions had been staggered at different times through the year?

The respondent mostly agreed with this idea. She felt that by so doing so, the Workshop would have been more closely aligned with the learning process of the attendees.

f) Would the Workshop have been more effective if follow-up had been provided?

This would have improved the effectiveness of the Workshop considerably in the mind of the respondent. She felt that as the Workshop was designed and presented, it encouraged the attendee to attempt to do too much in the classroom without adequate support. A formal support group would have helped to alleviate difficulties in this area.

g) Would the Workshop have been more effective if more trainers had been provided?

Not a major consideration. The Workshop as conducted had 7 or 8 trainers available to assist the 70 attendees working on 30 computers.

h) Would the Workshop have been more effective if another software package had been used instead of AppleWorks?
No. Most people were familiar with AppleWorks, if Apple computers were to be used.

i) Would the Workshop have been more effective if the learning groups had been smaller. (ie. limited to 2 persons per group)?

No! The respondent felt that the grouping could have been even larger (ie. groups of 4 or 5) without compromising the effectiveness of the inservice.

Subject: 041 **Interview Date:** June 17, 1991
Workshop Session Attended: Calgary

1. How chosen to attend the Workshop?
( ) Volunteered (**X**) Selected ( ) Assigned

Name was chosen from among a number of volunteers in the jurisdiction.

2. Expectations of the Workshop?

* Was already interested in computers and computer applications for the classroom and wanted to find out more about writing activities using computers.

3. Response to the Workshop:
a) Perceived balance between theory and practice? Good balance.

b) Duration:
( ) Too Long? (**X**) Too Short ( ) Satisfactory

The respondent felt that the Workshop was attempting to cover too much content in too little time. He compared it to a "university course" in depth and complexity. He would have preferred the Workshop to be spread out over a greater length of time.

4. Post-Inservice Support Received From:
a) Colleagues? Interested other teachers in Workshop strategies through jurisdictional inservices and inservices held at home school. These teachers subsequently used the respondent as a "resource person" to assist in the development of their own classroom computer programs.

b) Local Administration? Interested the Principal and Vice-Principal in the utility of computers in the classroom. They approved purchase of an additional 9 computers for the school as well as more software (ie. tutorials, word processing). Word of Workshop techniques spread to the jurisdiction central office and was communicated in a positive manner to a neighbouring jurisdiction who had not sent representatives to the Workshop. Subsequently, the neighbouring jurisdiction expressed interest in adopting classroom writing

programs based on the material presented in the Workshop.

c) Alberta Education? None!

5. Long Term Effects on teaching practice?
(Was attending the Workshop worthwhile in terms of the personal time and effort invested?)

The respondent felt that the main benefit of the Workshop was that it reinforced his belief in the applicability of the computer to educational uses. The "official" recognition of the utility of the computer on the part of Alberta Education helped in promoting the use of computers, and in expanding the resources devoted towards them.

The main difficulty the respondent encountered (and still continues to encounter) is the lack of computer resources - both hardware and software. With classes of 32 students and only 15 computers available, he felt that it was still impractical to institute many of the Workshop strategies in his own school.

6. Detailed Explanations of Survey Questions:
a) Program support provided following the Workshop? (As outlined in the response to Question 4.)

b) Opportunity to inservice other teachers?
* Inserviced teachers at jurisdictional P.D. Day.
* Held inservices at own school. Teachers from other schools also attended.
* Held an inservice in Grande Prairie - a pencil and paper session on the Writing Process.

c) Perceived benefit of "hands-on" approach?

The respondent felt that the Workshop attendees needed a prerequisite knowledge of the Writing Process to really internalize the Workshop material, regardless of the "hands-on" activities provided.

d) Would the Workshop have been more effective if it had been of a longer duration?

Yes, but only if the grouping of the attendees had been changed as well.

e) Would the Workshop have been more effective if the sessions had been staggered at different times through the year?

The respondent moderately agreed with this idea.

f) Would the Workshop have been more effective if follow-up had been provided?

The respondent felt that a follow-up session was needed to allow for practical application of the strategies presented during the Workshop. Difficulties encountered and possible alternatives to resolve them could then be discussed, improving the overall effectiveness of the effort.

g) Would the Workshop have been more effective if more trainers had been provided?

Dependent on the experience levels of the attendees.

h) Would the Workshop have been more effective if another software package had been used instead of AppleWorks?

The respondent didn't feel that this made much of a difference as long as the attendees had some knowledge about the Writing Process itself.

i) Would the Workshop have been more effective if the learning groups had been smaller. (ie. limited to 2 persons per group)?

Not necessarily smaller (or larger) groups were important. What the respondent felt was important was a "streaming" of the attendees according to computer or Writing Process experience levels. He himself felt that the Workshop became an "endurance test", particularly for those elements that were not applicable to his teaching situation. He felt that it would have been better if the computer and non-computer people or aspects had been separated.

Subject: 051 **Interview Date:** June 24, 1991
Workshop Session Attended: Calgary

1. How chosen to attend the Workshop?
(**X**) Volunteered ( ) Selected ( ) Assigned

* Was former President of the Alberta Teachers' Association Computer Council (ATACC).

* Felt that ATACC need representation at the Workshop, as it was the first large scale computer-based inservice program conducted in the province at the time.

2. Expectations of the Workshop?

* Had been informed beforehand as to the scope and content of the Workshop, and so felt good about its' prospects for success.

3. Response to the Workshop:
a) Perceived balance between theory and practice? Good balance.

b) Duration:
( ) Too Long? ( ) Too Short (**X**) Satisfactory

The respondent felt that the duration of the Workshop was dependent upon the experience level of the attendee, but taking all things into consideration, the Workshop was of just the right length. The respondent personally liked the opportunity to "network" with other attendees during the Workshop, and appreciated the fact that the design of the Workshop provided both the opportunity and the time for this to happen.

4. Post-Inservice Support Received From:
a) Colleagues? The respondent was already know for his commitment towards integrating computers into the classroom, so he felt that the response on the part of his colleagues was positive and supportive.

b) Local Administration? Full support was provided.

c) Alberta Education? No further contact was received except for the list of Workshop attendees.

5. Long Term Effects on teaching practice?
(Was attending the Workshop worthwhile in terms of the personal time and effort invested?)

"Yes it was, but perhaps the effect was most far reaching in a philosophical / political way rather than a direct pedagogical application. The Workshop was symbolic of Alberta Education's support for change in this area, and could be interpreted as an official sanction. This made it easier to facilitate change at the jurisdictional and school level."

6. Detailed Explanations of Survey Questions:
a) Program support provided following the Workshop? Extensive.
* There was a positive response from other teachers on staff concerning the Workshop, as it tended to confirm the things that they were already doing in the school. In that way, it acted as an affirmation of program direction.

b) Opportunity to inservice other teachers? Extensive.

* A strong commitment was made on the part of the jurisdiction to inservice teachers.

* Inservices were subsequently held for:
  a) Jurisdictional computer co-ordinators.
  b) Members of the Professional Development Committee.
  c) Interested Elementary teachers.

c) Perceived benefit of "hands-on" approach? Particularly useful.

d) Would the Workshop have been more effective if it had been of a longer duration?

(As outlined in the response to Question 3b.)

e) Would the Workshop have been more effective if the sessions had been staggered at different times through the year?

"Extremely important. Unfortunately, this was not done."

f) Would the Workshop have been more effective if follow-up had been provided? Yes.

g) Would the Workshop have been more effective if more trainers had been provided? Dependent on the experience levels of the attendees.

h) Would the Workshop have been more effective if another software package had been used instead of AppleWorks?

Yes. At the time of the Workshop, the respondent's school had only 5 computers available to serve the needs of more than 200 students, and these computers were IBM PC Jrs., not Apples. Having an alternative software choice available would have made it easier to implement [Workshop techniques] in more schools.

i) Would the Workshop have been more effective if the learning groups had been smaller. (ie. limited to 2 persons per group)? N / A

Subject: 069 **Interview Date:** June 20, 1991
Workshop Session Attended: Calgary

1. How chosen to attend the Workshop?
(**X**) Volunteered ( ) Selected ( ) Assigned

Was returning to active teaching after many years, so the respondent wanted to upgrade her skills in this area.

2. Expectations of the Workshop?

* To become more familiar with word processing software.
* To enhance writing skills.
* To find new ways to revise and edit at the Elementary level.

3. Response to the Workshop:
a) Perceived balance between theory and practice?

The respondent felt that a good balance was established and maintained throughout the Workshop. She particularly appreciated the time that was provided to record and write personal observations.

b) Duration:
( ) Too Long? ( ) Too Short (**X**) Satisfactory

Taking into account the wide experience background of the attendees - from Superintendents to High School Teachers to Elementary Teachers.

4. Post-Inservice Support Received From:
a) Colleagues? Minimal. Staff response was underwhelming.

b) Local Administration? Principal was initially enthusiastic due to availability of funding from the Educational Opportunities Fund (E.O.F.) to purchase hardware. When the Principal subsequently became a senior administrator, his interest in the idea of computer integration waned.

At the same time, computer integration efforts were being hampered by the administrative turmoil in the jurisdiction. Superintendents were coming and going nearly on a yearly basis, and the new Superintendents had no knowledge of the Workshop, and therefore were reluctant to support its' promotion.

c) Alberta Education? None, other than list of attendees.

5. Long Term Effects on teaching practice?
(Was attending the Workshop worthwhile in terms of the personal time and effort invested?)

Yes. In fact, the respondent was still using the information that was provided in the Workshop on the Writing Process in her own classroom program. The

Workshop also encouraged her to learn more about the Writing Process, and she subsequently attended a presentation by Donald Graves on the topic.

6. Detailed Explanations of Survey Questions:

a) Program support provided following the Workshop? Minimal to Moderate.

* She expected the Staff to be more enthusiastic about the prospects for using computers in the Writing Process than they were.

* Budget constraints were a problem, particularly with regards to hardware. The ongoing dilemma concerning which hardware option to choose (ie. IBM vs. Apple vs. Apple GS vs. Macintosh) complicated deliberations in this matter.

b) Opportunity to inservice other teachers?

* She did not have the opportunity to share her experience with the whole staff. Noon-hour sharing sessions were arranged on her own time, but these did not reach everyone on staff.

* On the jurisdictional level, nothing was done. The respondent herself hadn't felt that she had gained enough facility at the Workshop to make her an "expert", therefore she was reluctant to embark on a series of inservices, fearful that her own credibility would be put at risk.

c) Perceived benefit of "hands-on" approach?

A positive aspect, but dependent on the experience levels of the attendees.

d) Would the Workshop have been more effective if it had been of a longer duration?

Moderate disagreement. The respondent felt that the Workshop was "dragged out" longer than it had to be, possibly because of the various "audiences" that were attending.

e) Would the Workshop have been more effective if the sessions had been staggered at different times through the year?

Moderate agreement. This option could have addressed the problem of the Workshop being too long. Shorter but more frequent sessions would have been beneficial in the estimation of the respondent.

f) Would the Workshop have been more effective if follow-up had been provided?

Moderate agreement. The respondent felt that a resource person should

have been appointed. Perhaps a [Alberta Education] Regional Office could have been established to inform attendees on a regular and ongoing basis.

g) Would the Workshop have been more effective if more trainers had been provided? Not a real concern.

h) Would the Workshop have been more effective if another software package had been used instead of AppleWorks?

Moderate agreement. The respondent had no prior experience with AppleWorks, so she had to learn two new things at the same time (AppleWorks and the Writing Process) rather than being able to concentrate on just learning about the Writing Process - the main focus of the Workshop.

i) Would the Workshop have been more effective if the learning groups had been smaller. (ie. limited to 2 persons per group)?

Strong agreement. The respondent preferred having 4 to 5 people to a group instead of the 8 people per group that she eventually ended up in. She also felt that the various "audiences" (ie computer experts, Language Arts experts, etc.) should have been separated into different groups for the Workshop. This would have speeded up the whole process, as the presentation could have been tailored for a specific audience.

Subject: 075 **Interview Date:** June 18, 1991
Workshop Session Attended: Grande Prairie

1. How chosen to attend the Workshop?
( ) Volunteered ( ) Selected (**X**) Assigned

Was school computer co-ordinator at the time. The Superintendent asked the Principals to submit a list of potential candidates to attend the Workshop and the respondent was chosen from this list.

2. Expectations of the Workshop?

* The respondent had received the Workshop resource binder beforehand, so he had some idea of what was to be presented.
* He hadn't heard about the Writing Process before, so this was to be a new experience.
* He was aware that he would be obligated to provide an inservice of his own on the Workshop upon his return to his school jurisdiction.

3. Response to the Workshop:
a) Perceived balance between theory and practice?

The respondent felt that a good balance was maintained, although he felt that there appeared to be a lot of material covered [in the Workshop].

b) Duration:
( ) Too Long? ( ) Too Short (**X**) Satisfactory

4. Post-Inservice Support Received From:
a) Colleagues? Most teachers gave the new initiative a "lukewarm" reception - perhaps caused by a "wait and see" attitude.

b) Local Administration?
Administration recognized that computers were important and some budget money was made available for enhancing the computer program in the jurisdiction. For example: An initiative was begun to network the school computers. Unfortunately, other curriculum areas had a higher priority so additional computer initiatives were stalled.

c) Alberta Education? No follow-up.

5. Long Term Effects on teaching practice?
(Was attending the Workshop worthwhile in terms of the personal time and effort invested?)

* The respondent enjoyed the Workshop. This made him more willing to investigate further advances in his school program.

* The respondent tried some of the techniques and strategies outlined in the Workshop, but did not do any extensive implementation.

6. Detailed Explanations of Survey Questions:
a) Program support provided following the Workshop?
See response to Question 4.

b) Opportunity to inservice other teachers? Minimal.

The jurisdiction was proceeding with initiatives in other curriculum areas at the time and other goals were deemed more important for funding.

c) Perceived benefit of "hands-on" approach? Reasonable amount of "hands-on" activities provided.

d) Would the Workshop have been more effective if it had been of a longer duration? Dependent on the experience levels of the attendees.

e) Would the Workshop have been more effective if the sessions had been staggered at different times through the year? N / A

f) Would the Workshop have been more effective if follow-up had been provided?

Strong agreement. The respondent felt that the Workshop would have been much more effective if support groups had been established after the Workshop. There was lots of help available at the Workshop itself, but nothing was provided to aid in local implementation efforts.

g) Would the Workshop have been more effective if more trainers had been provided? No, the number of trainers was quite sufficient.

h) Would the Workshop have been more effective if another software package had been used instead of AppleWorks? N / A

i) Would the Workshop have been more effective if the learning groups had been smaller. (ie. limited to 2 persons per group)?

Neutral feelings. The respondent could see advantages and disadvantages for both larger and smaller groups.

Subject: 082 **Interview Date:** June 18, 1991
Workshop Session Attended: Calgary

1. How chosen to attend the Workshop?
(**X**) Volunteered ( ) Selected ( ) Assigned

The respondent expressed an interest in attending and was subsequently recommended by her school jurisdiction to Alberta Education.

2. Expectations of the Workshop?

* Not much information was provided beforehand, so the respondent really didn't know what to expect.

* The respondent was somewhat apprehensive, as the subject had had some word processing experience with Bank Street Writer, but had no AppleWorks experience.

3. Response to the Workshop:
a) Perceived balance between theory and practice? More "hands on" needed.

b) Duration:
( ) Too Long? ( ) Too Short (**X**) Satisfactory

The respondent felt that the Workshop duration could be judged better according to the experience level of the attendees. For someone who knew nothing about computers, the Workshop might have been too short, or conversely, too frustrating. Similarly, someone who only had computer expertise might have found the Workshop too long.

4. Post-Inservice Support Received From:
a) Colleagues? Mostly supportive.

b) Local Administration? Not any substantial increases in hardware or software.

c) Alberta Education? None, other than list of attendees.

5. Long Term Effects on teaching practice?
(Was attending the Workshop worthwhile in terms of the personal time and effort invested?)

The respondent felt that the Workshop was definitely worthwhile. She still applies many of the strategies and techniques that she learned at the Workshop into her current teaching practices. She characterized her attitude towards computers prior to the Workshop as being "a waste of time." Following the Workshop, she was convinced as to the utility of computers. Now she finds them easy to use and apply in her classroom program.

6. Detailed Explanations of Survey Questions:
a) Program support provided following the Workshop? Moderate support.

b) Opportunity to inservice other teachers? Moderate support.

School workshops were held. Another county workshop along with a follow-up workshop was also held. The Professional Development Committee also conducted a workshop.

c) Perceived benefit of "hands-on" approach?

A definite plus. Even more needed.

d) Would the Workshop have been more effective if it had been of a longer duration?

More interaction time should have been provided for the trainers to work directly with the attendees in the "hands on" activities.

e) Would the Workshop have been more effective if the sessions had been staggered at different times through the year? N / A

f) Would the Workshop have been more effective if follow-up had been provided? N / A

g) Would the Workshop have been more effective if more trainers had been provided?

Not more trainers. Just a better use of them. (ie. providing more time for one-one interaction.)

h) Would the Workshop have been more effective if another software package had been used instead of AppleWorks?

Strong disagreement. The respondent liked AppleWorks and was comfortable using it. This made it easier to get on with learning about the applications of the software rather than the software itself.

i) Would the Workshop have been more effective if the learning groups had been smaller. (ie. limited to 2 persons per group)?

Strong disagreement. The respondent felt that larger groups provided a greater range of experience, which was helpful when difficulties were encountered.